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BALTIMORE, MARCH 27, 1913.

### THIS ISSUE AND ITS MEANING.

This week's issue is published in two parts. Part I covers the usual work of the MANUFACTURERS RECORD; Part II is the story of the South as it is told under the general title of "The South: The Nation's Greatest Asset." Part II is, of course, sent to every subscriber and exchange as an integral portion of this date's issue.

For many years it has been the custom of the MANUFACTURERS RECORD to occasionally publish special editions broadly devoted to telling of Southern resources, Southern progress and Southern potentialities. In Part II of this issue we have endeavored to continue this line of work, and in this particular case to bring together the facts and figures which we believe will convince the intelligent reader that the natural resources of the South and its geographical location combine to make it the greatest material asset of the nation. And this is not in any narrow, sectional spirit, but on the broad platform that the full development of the South's resources will enrich the nation and round out its fullest national life. Last year we published Part II of our issue of February 22 under the general title of "Thirty Years of Southern Upbuild-

ing." That commanded wide attention in this country and abroad. It resulted in such a turning of the thought of investors and prospective settlers to the resources of the South and awakened such general interest among our Southern readers that there was an immediate and insistent call for another publication along similar lines. This issue is the answer to that call.

We believe that in "The South: The Nation's Greatest Asset" we have fulfilled our promise that this publication should be on a broader plan, more interesting and more valuable than was "Thirty Years of Southern Upbuilding." The very title will awake universal discussion as to the correctness of the claim that the South is the nation's greatest asset. Some will be disposed aggressively to question this position, some will study it with open mind, and some who had never thought of the South in this light will have an awakening as to what this section has and what its future is destined to be. This title was selected advisedly, knowing that it would create discussion, and that out of this very discussion would come a great illumination to the whole nation as to what the South is, what it has accomplished and what its future will be. It is not, of course, intended to suggest that the South has at present any such development as the East or the West. Some have supposed that we were undertaking to prove that. No one, it would seem, could have thought carefully on the subject and imagined that the MANUFACTURERS RECORD knew so little about the smallness of the developed wealth of the South as compared with the enormous wealth of the East and West as to take that position. Our aim has been to show not simply what the South has done in its advance from the poverty of 1865 to its relative prosperity of today, but to point out the extent of the resources for future development which combine to make this section the nation's greatest asset.

Assets do not necessarily consist in accumulated wealth, but in resources, the development of which will bring wealth. And when the resources of the South in minerals, timber, soil, climate, water-powers, geographical location, with reference to strategic advantages for world-wide trade, are considered, it will be seen that the South has assets which in part duplicate those of other sections, while it has others which are a monopoly. Cotton, for instance, is a natural monopoly controlled by the

South, the foreign exports of which have alone made possible the maintenance of the balance of trade of the nation in our favor. There are many other resources in which the South leads the nation, and it is the combination of all these which justify the statement that the South is the nation's greatest asset. We believe Part II of this issue will sustain our claim. Read it carefully and see if you do not agree that we have demonstrated our right to the title given.

A copy of Part II of this issue, "The South: The Nation's Greatest Asset," is sent to every subscriber to the MANUFACTURERS RECORD.

### WILL THE SOUTH'S FUTURE BE WORTHY OF THE PAST?

To whom much has been given, of him will much be required.

To an extent greater than can be fully depicted in words or fully comprehended even by the most thoughtful student of this unique situation the South has been given resources for industrial and agricultural prosperity, for world-encircling commerce and for general material upbuilding.

In the olden days prior to 1860 the South proved itself worthy to hold these resources as trustee for their utilization.

Since 1865 the South has proven equally as worthy of this trust. Despite almost overwhelming obstacles and burdens of many kinds, the South since 1865 has to its credit very remarkable achievements.

In what the old South did in the utilization of these resources, and of what its people have done between 1865 and the present, this section can well afford to take pride. In these two periods of its life the South has proved itself worthy of the trust committed to it through its endowment by nature with its unequalled combination of advantages.

What of the future? is the question which the world now has a right to ask.

Will the coming years show a people of the same stamina as those who have gone before? Will coming generations match those that have passed away? Will their work for the advancement of the industrial, agricultural, railroad, financial and educational interests of this section be as great relatively as that of the men who created the business activities of the old South, and that of the men who coming out of the

war faced and solved the problems of that day and started the South upon its present career of upbuilding?

Will the coming South be worthy of the past South?

That is a question which the people of the 16 Southern States may well ask themselves. They have received a great heritage; a heritage of resources of which the world has no duplicate; a heritage of an honored name, more to be desired than great riches.

Upon the South of today and of coming days will rest a greater responsibility than upon the people of that section during any preceding period in its history. They are not only the heirs of the wealth of raw materials, of climatic and geographical advantages, but of all that has been achieved and of the world's concentration of thought upon the South, and the world's acceptance that this is the most favored land known to man. What will the future show of achievements as compared with those of the past, studied in the light of present conditions in contrast with the conditions of former years?

The facts published in Part II of this issue under the broad, general title of "The South: The Nation's Greatest Asset" should be seriously studied by the people of the South. These facts tell of what has been done and of the resources on which to base future operations. But these very facts, rightly interpreted, also tell of the responsibilities which rest upon this section that the people of this generation may prove themselves "worthy sons of worthy sires."

What of the future? Will its record when written tell of achievements in material things for the betterment of mankind, the advance of educational and religious activities in keeping with what has been wrought in the past, or will it tell of wasted opportunities by a people who have not measured up to the situation?

We have faith that the sense of responsibility to themselves and to the world will be developed in Southern people to a larger extent even than ever before. We believe that more and more they will realize that great opportunities bring great responsibilities; that the proud heritage which is theirs demands achievements worthy of it.

Unto the past let all honor be given, but let us at the same time prove worthy of that past, may well be the universal sentiment of the people of this heaven-favored land.



## A STUDY OF MUNICIPAL GOVERNMENT.

In this day of discussion of the many problems of municipal government and study of the varied forms of such government any light upon the experiences of old cities or new ones is of value. Much is being published on the subject in fleeting or in permanent form. A vast amount of material is being accumulated. A practical and timely contribution is the work of Frank Putnam, which has just been issued by the city of Houston, Tex.\* In the summer of 1912 Mr. Putnam, who for quite a while had been active and successful in intelligent publicity work for Houston, was commissioned to make a six months' study of the organization and management of public works and governments of cities in Europe with a view to the application of the lessons in the experience of such cities to the development of Houston. The spirit shown by that municipality in inaugurating this investigation is typical of Houston and accounts, in large measure, for the notable progress that that Texas city has made in recent years. The results of the study, embodied in an attractive volume, are not only full of suggestions for Houston, but they have interest for every other city that is striving to do its best to make the most of the pressing opportunities of the day for municipal advancement. In the six months at his command Mr. Putnam visited Cork, Ireland; Glasgow, Scotland; London, England; Düsseldorf, Hamburg, Hanover, Munich and Berlin, and accumulated a vast amount of definite information which he has assembled in workable form, and has supplemented it with recommendations based upon it for the future administration of the municipal affairs of Houston. Whether or not the recommendations be carried out, the city has a valuable handbook of sound advice, in the preparation of which it has been given a wide, practical advertisement of the best sort.

## RAISING ONE'S VOICE FOR THE SOUTH.

When I think of the South as a land of wasted opportunities, I cannot refrain from raising my voice like one crying in the wilderness.

That is a sentence from a letter to the MANUFACTURERS RECORD from a Mississippian who for quite a while has been raising his voice quite effectively in the cause of the material development of his section. He is Charles E. Chidsey of Pascagoula, and our readers are well acquainted with the work he has been doing for his community and his State through persistent publicity in our columns. His correspondence has taken a wide range, and we have no doubt that he is capable of filling every week two or more pages of our issue with interesting matter suggesting opportunities for profitable investment of money and muscle and inspiring others to greater endeavor for the South. In fact, in the letter from which the quotation is made Mr. Chidsey assumes rather an apologetic attitude toward his sending us so much for publication. There is no need of apology. We can recall nothing that he has submitted which was not worthy of publication, and the only reason why all that he sends is not published is the fact that our space is limited. The field of the MANUFACTURERS RECORD is so wide, cov-

\*City Government in Europe. By Frank Putnam, special commissioner of the city of Houston in the cities of Europe. Published by the city of Houston.

ering nearly 1,000,000 square miles of the territory of the United States more active in development on many lines than any other like area, that our main problem is not how and where shall interesting and valuable matter be obtained each week, but how best for the whole South shall be handled the vast amount of matter that the telegraph and mail bring us for publication.

Mr. Chidsey is one of a number of alert Southern men, keen observers of current events, familiar with potent facts and recognizing the MANUFACTURERS RECORD as the medium for attracting attention to the waiting opportunities of the South. The situation is hardly one of wasted opportunities, in the strictest sense of the term, but of time lost in making the most of opportunities. In some cases Opportunity knocks but once at any one door. In the case of farm lands, of mineral resources, of water-powers, of forests the most has never yet been made of Southern opportunities, and there has been much waste in the handling of coal and other minerals and of the forests. But the natural resources are so vast that the wealth that has been lost through neglect to develop or through recklessness in use is practically as nothing compared with the wealth that may still be derived from the building up of lands

When you have studied Part II of this issue, which, under the general heading of "The South: The Nation's Greatest Asset," more broadly covers the resources for material upbuilding and the progress of this section since 1880 than was ever before done, we believe you will want a cloth or a leather bound copy for your library in addition to the paper bound copy which you receive as a subscriber to the Manufacturers Record. Moreover, you will probably want a few additional copies in either one of these bindings or in paper, to be sent to business associates or friends in order to give them more information about the South than they have ever had. We shall be glad to receive your order as promptly as possible, as we expect this edition to be rapidly exhausted, for any number of extra copies you may desire. For five copies or less orders should be accompanied by check. The price is \$1 a copy in paper; \$1.50 in cloth binding, and \$3 in leather.

now lying idle, the reclamation of millions of acres of wet lands, the utilization of cut-over timber lands and the scientific treatment of rich, virgin lands; from the application of chemistry to the refuse of lumbering operations and to the by-products of mining and manufacturing; from economic liberality in the exploitation of its coal, its phosphate rock, its salt, its sulphur, its lead and zinc and other minerals, and from the best use of its streams for power and transportation. Meanwhile, we hope that every man devoted to his section will continue to swell the chorus of voices telling of the South's great opportunities.

## A TRIP TO EUROPE.

One of the mistakes of the Congress that expired on March 4 was the provision for an expenditure of several thousand dollars upon a commission to spend 90 days in Europe this spring "studying" co-operative rural credit unions and similar organizations. Of course, a trip to Europe at Government expense is a pleasure, but the amount of information of the slightest value to the people of this country that the commission may obtain in that way must necessarily be largely a duplication of the material available in this country and accessible in a short walk in Washington or in an expenditure of a few cents for postage.

## RAILROAD WHEELS AND DERAILMENTS.

Statistics credited to the Interstate Commerce Commission and published by the *Iron Age* concerning derailments of trains resulting from defects of equipment show that more than 25 per cent. of such accidents occurring during the year ended June 30, 1912, were owing to the breakage of wheels either in whole or in part. The total of this class of accidents was 3847, of which 627 were due to the fracture of wheel flanges, while 357 were caused by the breaking or bursting of entire wheels, the total thereof (984) being the percentage mentioned. In the same year rails broken accounted for only 363 derailments, although defective rails are popularly supposed to account for a majority of wrecks when trains leave the tracks, and those resulting from wheel failures were many more than those consequent upon any other equipment cause, the next greatest number being 528, covering accidents due to broken or defective brake rigging. Closely related to these, however, are 410 derailments owing to broken axles or journals. Here are consequently 1384 derailments due to failure of wheels or axles, or more than 36 per cent. of the grand total. Worst of all is the fact that the number of such acci-

In studying the report of defective-equipment accidents year by year from 1902 to 1912, inclusive, some interesting data is revealed. For instance, the number of accidents resulting from broken or burst wheels (not the flanges of wheels) dropped from 172 in 1902 to 162 the following year, but rose to 240 in 1904. In 1905 it was 235, but in 1906 it fell to 182, and since then it has varied annually between 220 and 242 until 1912, when there was an abrupt leap to 357 from 235 the year before. Yet the annual number of accidents due to broken flanges of wheels alone has also varied during the period under consideration. It rose year by year from 290 in 1902 to 603 in 1907. Two years later it had fallen to 518, but in 1910 it rose again to 619, and has since remained around the 600 mark. These figures appear to sustain the idea that the railroads at certain times and in particular lots of equipment receive poorer materials in wheels than they do at other times.

Nothing should be left undone which may incline to assure to the railroad companies substantial wheels under their equipment. Economies in purchasing are entirely too costly when paid for in train wrecks.

## DOLLAR DIPLOMACY DOOMED.

President Wilson has rendered signal service to his country in giving a solar plexus blow to "dollar diplomacy." For more than a decade the people of the United States have been paying the bills of that brand of diplomacy, which implies the use of the power of the United States to guarantee the ventures of special interests in exploitation of the peoples of other lands, the weaker the people the more strenuous having been the diplomacy. The policy has stained the honor of this country, has committed pliant occupants of important and influential posts in the Government to alliances with the "dollar diplomacy" of other mighty peoples in browbeating so-called backward ones, and has been of no material benefit to the people of the United States as a whole. The apex of the triangle, to use the figure of Huntington Wilson, has been able to employ without payment the tremendous force of the American people expanding behind it to the base. It was time for this triangle in diplomacy to be resolved into a straight line. President Wilson has done it.

## THE BIGNESS OF THIS COUNTRY.

Europe has a population of about 400,000,000. The people of the United States number 95,000,000. A sidelight upon the bigness of this country in comparison with Europe is thrown in some figures of postal, telegraph and telephone traffic. The total of messages of the three classes for Europe in 1911 was 22,870,000,000, or 72 for each of the population, and for the United States 24,208,000,000, or 255 for each of the population. Of the total number of messages, 16,500,000,000, or 72.2 per cent., were first-class mail; 6,000,000,000, or 26.2 per cent., were telephone conversations, and 370,000,000, or 1.6 per cent., were telegrams in Europe, and 14,400,000,000, or 59.5 per cent., were telephone conversations; 9,700,000,000, or 40.1 per cent., were first-class mail, and 108,000,000, or four-tenths of 1 per cent., were telegrams in the United States. Or, in other words, while Europe had about three and a half times the telegraph traffic of the United States and nearly twice the first-class mail traffic, it had

only two-fifths as much telephone traffic as this country.

These figures are taken from the annual report of the American Telephone & Telegraph Co. for 1912, which gives other interesting statements bearing upon the operations of the Bell Telephone system which it controls. In comparison with about 65,000 postoffices, 60,000 railroad stations and 25,000 telegraph offices that system's toll lines reach 70,000 places. In 1912 it had 7,456,074 stations, 2,502,627 of which being operated by local co-operative companies or associations and rural independent companies or associations. Between 1900 and 1912 there was an increase in pole lines from 131,538 miles to 315,003 miles, or 139 per cent.; in length of wires, underground, submarine and aerial, from 1,961,801 miles to 14,610,813 miles, or 645 per cent.; number of stations from 855,911 to 7,456,074, or 771 per cent.; number of employees from 37,067 to 140,789, or 280 per cent., and number of daily exchange connections from 5,668,986 to 25,572,345, or 351 per cent. The average daily toll connections in 1912 were 737,823, and all connections were at the rate of \$472,000,000 a year. Since 1900 the company has spent \$596,043,300 upon plant additions, the annual expenditures increasing from \$31,619,100 to \$75,626,900. The book costs of the properties of the company on August 1, 1912, was \$736,000,000. In the past five years the gross earnings of the company have increased \$70,600,000, of which \$54,900,000 have gone into increased expenses, leaving an increase of \$15,700,000 in net earnings. Of this increase \$3,700,000 went into increase in interest and \$11,300,000 into increase in dividends. The 1912 surplus was \$13,200,000, an increase over 1907 of \$700,000.

#### THE NATIONAL INCOME TAX.

Day by day are put forth from Washington reports of tentative minimums of income being considered by the framers of the proposed national income-tax law. One day the minimum is placed at \$5000, another day it is \$4000 and another, \$3500. The impression created is that the aim is to seek a minimum and the consequent tax rate to meet the deficiency in Federal income caused by reduction of tariff duties. The solution of the problem is sought in estimating the amount of customs revenue under the new tariff and the aggregate of incomes in the country. Both propositions must necessarily be rather nebulous at present. Probable embarrassment for the Government may be avoided, first, by revision of the tariff and adjustment of schedules upon a basis that will assure from customs revenue an income which, together with returns from internal revenue and other sources, will meet the legitimate expenses of Government until a careful census may disclose within some degree of accuracy the aggregate amount of incomes received by citizens of the country. To the same end, steps should be taken immediately for the abolition of a large number of incomes derived from service to the Government in undertakings with which the Government should have nothing to do. Several thousand offices could be abolished without interfering with the legitimate business of the Government. This retrenchment should be accompanied by the development in the consciousness of the legislative branch of the Government that an income tax, to be equitable and strictly constitutional, should have no

minimum, but should be levied upon every man having an income, great or small.

#### SELF-ETCHED.

The recherche letter of Huntington Wilson announcing his disappearance from the domain of diplomacy at the ripe old age of 38 years made entirely unnecessary any explanation by President Wilson in promptly and tersely acknowledging the letter.

#### TO UTILIZE PINE WASTE.

##### A Louisiana Company to Co-operate With Lumbermen.

[Special Cor. Manufacturers Record.]

New Orleans, La., March 19.

The Forest Products Co., organized under the laws of Louisiana with an authorized capitalization of \$5,000,000, has opened offices in the Whitney-Central Building, New Orleans, and is conducting a campaign to secure the co-operation of large sawmill operators in the construction of plants for utilizing yellow pine waste by a process covered by patents owned by the company. The well-known lumberman and timber operator, James D. Lacey, of New Orleans and Chicago, is the president of the company, and he, together with Wm. Danner, vice-president, had been for some years conducting experiments until the perfected system was made commercially successful. H. S. Sackett, also vice-president, has been for years identified with Government forestry work, and will have charge of the office details. The company has erected a plant at Slidell, La., which has been in successful operation for some months, and which is now being very greatly enlarged. By the operation of this plant it is announced that a cord of "fat" wood will produce minimum revenue as follows:

60 gallons of tar at 75c.....	\$4 50
700 pounds of charcoal at 15c.....	3 50
8 gallons of turpentine at 40c.....	3 20
7 gallons of wood creosote at 30c.....	2 10
3 gallons of pine oil at 30c.....	90
Total.....	\$14 20

The cost of handling a cord of fat wood at the Slidell plant is given as follows:

One cord (4000 lbs.) of wood, delivered.....	\$3 00
Oil for fuel.....	2 00
Labor, insurance, interest and overhead expense.....	2 00
Total.....	\$7 00

This indicates that a very safe margin of more than \$5 a cord can be counted on as the profits of operation.

In broad terms, the process involves both steam and destructive distillation. The plan of operation evolved is to have the sawmill operators advance the money to construct a plant, which, generally speaking, would cost about \$50,000 for a minimum efficiency size of the plant. The Forest Products Co. would give the mill operator in return preferred stock in the company, and would operate the plant according to the scientific methods demonstrated to have the greatest efficiency. It is also proposed by the company to organize a selling department and to scientifically carry out laboratory investigations for the demonstration of the various uses to which the products of the plants may be applied. ALBERT PHENIS.

#### MARBLE BY TRAINLOADS.

##### Shipments from East Tennessee for Use in New York City.

[Special Dispatch to Manufacturers Record.]

Knoxville, Tenn., March 24.

The largest shipment of marble ever made from East Tennessee left Knoxville Saturday morning. It required a solid train of nineteen cars consigned to New York, to be used in the new banking building of Morgan & Co., being erected on Wall Street opposite the Stock Ex-

change. The shipment was principally of block marble, with some sawed, and was of pink and chocolate hues. The valuation of this one shipment was placed at \$20,000. Its weight was a million and a quarter pounds. This shipment is to be followed by many others, it being estimated that it will require 250 flat cars to haul all the marble contracted for, as the building is to be erected entirely of East Tennessee marble. Considerable of the marble which is to follow will be sawed here, and will be for interior work, which, of course, is considerably more expensive, and it is probable that the total cost of the marble alone will be at least \$400,000. The shipments that are to follow are to be in trainloads. Another train will leave here in a few days. The train dispatched Saturday was reported on by wire from Washington. It left Knoxville at 11 o'clock Saturday morning and passed Washington at 8.35 o'clock this morning. The following firms are making the shipments, all of them having offices at Knoxville: Rose Republic Marble Co., Asbury Marble Co., Gray Eagle Marble Co., Royal Marble Co., Victoria & Tennessee Producers' Marble Co.

#### SERUM OF HUNTINGTON HUSTLE.

##### Its Effects Seen on the Industrial Growth of the West Virginia City.

[Special Cor. Manufacturers Record.]

Huntington, W. Va., March 21.

When the census of 1900 was taken, Huntington, Parkersburg and Charleston were found well "bunched" in the race for second place among West Virginia towns, each of the three having between 11,000 and 12,000 population, while Wheeling hovered somewhere about the 40,000 mark. By 1910 Huntington's population had grown to more than 32,000, and held second place. Whether the city can maintain the tremendous pace it set for itself during the past decade remains to be seen, but it cannot be disputed that up to the present time it has been kept up, and hustling citizens seem determined that there shall be no halt. Buildings are going up on all sides, industrial concerns are moving in, and people are coming to take part in the city's progress and prosperity. The "Huntington spirit" seems to imbue all who come to the city, and every man who gets into business here is inoculated at once with the serum of Huntington hustle.

For many years from its birth, in the early seventies, Huntington was strictly a "railroad town." The shops of the Chesapeake & Ohio Railroad were located here. It was the end of two divisions, and the train crews made it their home. Then were built the Ensign car works, now owned and run by the American Car & Foundry Co., where thousands of cars have been built. These works and the railroad shops laid the foundation of a big industrial life, and the consequence is that other manufacturing plants moving in have found factory labor ready to their hand.

The Guyandotte River, that empties into the Ohio at the corporation borders of the city, drains a valley that was particularly rich in high-class timber, and millions of feet were brought down in rafts to be made into lumber at Huntington. Just below the city comes into the Ohio the Twelve-Pole River, and it, too, has brought its millions of feet to the Huntington mills. So that a number of years ago Huntington became an important sawmilling point, a position it still retains. Then, impelled thereto by reason of the labor, the transportation facilities and other inviting features connected with Huntington's location, and the spirit of eternal and everlasting hustle that ani-

mated the people, other industrial concerns of one kind or another began to establish themselves here, until there are in the neighborhood of a hundred such, giving employment in the aggregate to about 8000 people.

In addition to the railway and car shops, there are now in business here four furniture factories; perhaps the largest molding and picture-frame factory in the United States; a factory that makes pews for churches and one that makes school furniture; a number of sawmills and planing mills, several foundries, two of which make stoves of different kinds and another of which makes gas stoves; brick works, one of which makes pressed brick; a plant that makes roofing tile; one that makes auto trucks; a bed-spring company; a mattress company; plants that make tumblers, hogsheds, barrels, handles, bungs, boxes and veneers; four broom factories; a distilling company and a brewery. There is a chinaware concern that turns out high-class tableware, an overall factory and a sash, door, blind and inside trim mill. There are two flour mills, two wagon-making plants, a shoe factory and a concern that, in addition to monuments and other work for cemeteries, turns out marble wainscoting and general inside finish for buildings. There is a paint factory now in operation, and another plant just moving in that will make pigments for inks, wallpaper, the clarification of sugar, etc. At least three first-class printing and publishing houses do business here, and turn out high-grade book work and printing and binding of all kinds. There are several bakeries that do business throughout a very considerable scope of country reached by the railroads centering here.

For the purpose of getting Huntington's manufactured products gathered together so that Huntington people may themselves see and appreciate what is being done in the town, the business men organized the Huntington Industrial Exhibition to give a show lasting until April 1. This show is held in the Biggs Armory, a building with a floor area of 80x170 feet. While the energetic men who have headed the movement that brought about this exhibition have had some trouble to induce manufacturers to exhibit their wares—and indeed, have failed to secure exhibits from all—the prediction is freely made by those familiar with such things that before the first exhibition is over those who have refused to take part in this one will be applicants for space in the next, and that a much larger building will be necessary for the years to follow.

About a year ago the business men of Huntington organized a company to purchase and control a natural-gas field from which gas could be piped into the city and here sold to industrial plants at prices that would prove inviting. The stock was sold, the field secured, the wells put down, the pipe line built, and now there is an abundance of gas for sale to manufacturing concerns at five cents per thousand feet. The company has 10,000 acres of gas land in the Lincoln county field, and has secured options on 14,000 acres more. The output is expected to last for a good many years, and as long as there is any gas coming it will be sold to factories at what it costs. Contracts for five years are made with users, with the guarantee that at the end of the five years they can be renewed at the price gas is then costing the gas company. The lines do not yet reach many parts of the city, as the work of laying pipe was delayed until a season when good weather may be expected. As soon as that season comes the work will be prosecuted as rapidly as possible, and before next winter it is expected



that the company's lines will reach all the factory districts of the city.

The knowledge of Huntington's possession of cheap gas has gone out through the country, and many inquiries have come in from manufacturers in various sections who are contemplating changes of location. Some plants have already been secured, and are now at work here, or getting ready to begin work, and others are upon the point of signing contracts to come. Among these latter are two or three large glass factories, and there is little doubt that several such will be located here during the year.

It is doubtful if any set of business men ever did a more farsighted thing for the board development of their city than did the men of Huntington when they put themselves in control of a big gas field and piped the product into their town. The wonder is that half a dozen other West Virginia towns have not done the same thing.

Huntington has become within the last three years a Burley tobacco market of great importance, and millions of pounds of that product are brought in here for sale annually. The Huntington Tobacco Warehouse Co., established here two or three years ago, handles a large percentage of the tobacco, which it sells on commission, and during the season of such sales representatives are here from all the principal tobacco manufacturing concerns in the country. In addition to this warehouse company, there are maintained here agencies of the American Tobacco Co., Liggett & Myers Tobacco Co., R. J. Reynolds Tobacco Co., H. E. Spillman & Co., Hugh Ellis Boyd Tobacco Co. and the J. P. Taylor Company. The sales run into the millions of dollars, and the money is widely distributed among the farmers of half a dozen of the West Virginia counties lying nearby.

In addition to the transportation facilities furnished by the Ohio River, Huntington has the Chesapeake & Ohio and Baltimore & Ohio railroads running into her stations, with the Norfolk & Western crossing the Ohio River but a few miles below. The Guyandotte Valley branch of the Chesapeake & Ohio leaves the main line at the city's edge, and the Big Sandy branch of the same road leaves it but 12 miles below. An up-to-date well-equipped electric traction line connects the city with Guyandotte and Kenova, W. Va.; Catlettsburg and Ashland, Ky., and Ironton, O. The Chesapeake & Ohio is building a very handsome and commodious passenger station here.

These transportation facilities have been the means of helping Huntington merchants to build up a big jobbing business in dry goods, notions, groceries, hardware, flour, shoes, furniture and numerous other staple lines, and have also led to its adoption by many manufacturing concerns as the location for agencies.

GEO. BYRNE.

## Two Western Carolina Counties.

Jefferson, N. C., March 20.

Editor Manufacturers Record:

Ashe and Watauga counties, in the extreme northwestern corner of North Carolina, are perhaps the most populous and prosperous section of the United States without railroad facilities. The Virginia-Carolina Railway Co. has now under construction a railroad through the counties from Abingdon, Va., via Jefferson, the county-seat of Ashe, to Boone, the county-seat of Watauga county. The work on this road is being pushed as rapidly as possible, and from all appearances it will be in operation within a year. With the completion of this railroad the counties will undoubtedly begin a period of development which will afford many opportu-

nities to men of capital and industry to make money.

The country about Jefferson has a general elevation of about 3000 feet, and many mountain peaks rise above this from 1000 to 2500 feet, overlooking in numerous instances considerable areas of practically level land excellent for hotel or townsites. It is a part of the region known as "The Land of the Sky," or sometimes "The Sapphire Country," and is unsurpassed in natural scenery and climatic conditions by any other portion of that famed region.

The section has already, without any exploitation whatever, become of considerable note as a fruit-growing country. Due to certain peculiar conditions of climate, and the topographical features of this section, fruit is but slightly affected by insects or disease, and the destruction of the young fruit by frost is unusually rare. Fruit trees, without any of the attention usually given to commercial orchards, thrive and bear crops of fruit year after year without intermission for 50 to 75 years or longer.

The 50,000 people of the counties of Ashe and Watauga, with their mines, forests, water-power and fruit-growing possibilities, open their doors and extend a hearty welcome to men of capital and industry.

CYRUS H. SMITHDEAL.

## BUYING BY SPECIFICATIONS.

### Federal Government's Methods of Purchasing Coal.

Large users of coal will be interested in Bureau of Mines Bulletin No. 63, "Sampling of Coal Deliveries and Types of Government Specifications for the Purchase of Coal," which has just been issued. The Federal Government, which purchases \$8,000,000 worth of coal annually, buys more than half of it under specifications, and has gone deeply into the question of sampling and analyzing coal. George S. Pope, the engineer in charge of such investigations and the author of the bulletin, makes the following statements:

To determine with utmost accuracy the ash content and heating value of a quantity of delivered coal would require the burning of the entire quantity, and special apparatus arranged to measure the total heat liberated, or would require crushing the whole quantity and reducing it by an elaborate scheme of successive crushings, mixings and fractional selections to portions weighing approximately one gram, the minute quantity which the chemist requires for each determination. Either of these procedures is obviously impracticable if the coal is to be used for the production of heat and power.

The method actually employed is to select portions from all parts of a consignment or delivery of coal and to systematically reduce the gross sample, obtained by mixing these portions, to quantities that the chemist requires for making ash determinations or that can be burned conveniently in the calorimeter, an apparatus for determining the heating value. The gross sample should be so large that the chance admixture of pieces of slate, bone coal, pyrite or other impurities in an otherwise representative sample will affect but slightly the final results. Increasing the size of the gross sample tends toward accuracy, but the possible increase is limited by the cost of collection and reduction. In reducing the gross sample by successive crushings and halvings or fractional selections the object is to procure a small laboratory sample that, upon analysis, will give approximately the same results as the gross sample itself, or, in fact, the entire quantity of coal from which the gross sample was obtained.

Recognizing the importance of the

method of sampling as being a definite commercial procedure and of having the method clearly set forth in the specifications to become a part of the contract, and recognizing also the desirability of insuring uniformity and similarity in the specifications used by the different branches of the Federal service for the purchase of coal, representatives of the executive departments and independent establishments of the Government held a conference under the auspices of the Bureau of Mines in February, 1912, for the purpose of discussing these and other features of the specifications. At this conference committees were appointed to prepare specifications in accordance with the views of the members. It was recognized at the conference that in general specifications, such as were recommended, certain requirements had to be of wide application, as the specifications cover such a wide variety of conditions, not only as to character and quality of coal, but as to type of furnace equipment, size of deliveries, methods of delivering, etc.

The specifications which were used for the purchase of coal on the heat-unit basis prior to the fiscal year 1912-13 were on the B. T. U. (British thermal unit) "as received" basis; that is, payment for delivered coal was directly affected by the moisture content of the sample received by the laboratory. This method was based on the assumption that the moisture in the samples collected at the time of weighing and delivery could be preserved with slight loss during the storing and subsequent working down of the gross sample to a quantity convenient for transmittal to the laboratory and in its later treatment in the laboratory. From experiments that have been made and from a large mass of data, it is known that the moisture content of coal does not remain constant, and that the moisture content reported by the laboratory may be as much as 5 to 10 per cent. lower than that actually contained in excessively wet or high-moisture coal at the time of weighing.

\* \* \* As a sample loses moisture, its B. T. U. "as received" value correspondingly rises, with the result that the price for delivered coal determined on the "as received" value is, with rare exceptions, higher than that warranted by the quality of the coal at the time of weighing. As a general statement, payment based on the "as received" B. T. U. value will be higher than warranted unless the sampling and laboratory work can be carried on under conditions that minimize moisture loss, as under freezing temperatures.

Recognizing the uncertainty involved in taking the moisture determination in the laboratory as representative of the moisture content of the delivered coal and the consequent possibility of payment of a higher price than is warranted, the Bureau of Mines recommended to the executive departments and independent establishments of the Federal service that the heating value in the coal specifications for the fiscal year 1912-13 be on the "dry coal" basis.

In preparing these specifications the fact was recognized that the amount of moisture contained in coal produced from day to day from the same mine, or group of mines working the same bed, is largely accidental, and is a matter over which the buyer and seller have only slight control. However, in order to place a negative value on high-moisture coals and to protect the Government against the delivery of coals containing excessive amounts of moisture, the specifications require the bidders to specify the maximum moisture content in coal offered. This value becomes the standard of the contract.

If the coal of uniform B. T. U. "dry coal" value is delivered on a contract, the contractor receives the advantage on any delivery in which the moisture content approaches the maximum specified, because he is paid for the weight of water contained in the coal in excess of a normal amount, whereas if the coal is very dry, containing less than the normal amount of moisture, the purchaser receives the advantage. \* \* \* As an example of the effect of a heavy rain on a car of coal in transit, a precipitation of three inches of water on a loaded 50-ton car, area of top about 360 square feet, would increase the weight of the coal 5.01 per cent., provided none of the water drained out or evaporated. It is obvious that if this coal is weighed and delivered immediately, special samples for moisture determinations should be collected and prepared at once and sent to the laboratory as a basis for equitable adjustment of payment on account of the excessive amount of water in the coal. As the weight of the coal was increased by the excess water, there should be a corresponding decrease in the price to be paid.

If a railroad car or wagon so rained on should not be unloaded immediately after weighing and special moisture samples should not be properly collected, prepared and sent hermetically sealed to the laboratory, it is obvious that the purchaser would pay a higher price than warranted, especially if the car or wagon stood for some time before sampling and some of the water drained out. Further, if the coal was not immediately unloaded and sampled, or if the car continued in transit after weighing, then the coal at the top would soon dry; and in either case the effect of the three-inch rainfall, as indicated by the analysis, might be only a fractional percentage of the moisture contained in the coal at the time of weighing.

The determination of the moisture of coal delivered from stock piles is often of great importance, for the proportion of moisture contained in the small sizes, which are most abundant near the center of a stock pile and which absorb the rains and melting snows in districts of heavy snows, may be from 10 to 15 per cent. higher than when stocked. It is apparent, therefore, that special moisture sample determinations are necessary for equitable adjustment of payment on amount of excessive moisture in coal which is stocked in piles exposed to the weather.

The specifications provide for the collection of "special moisture samples" if, in the opinion of the Government officials sampling it, the delivery contains moisture in excess of that guaranteed by the contractor. The "special moisture samples" are prepared in a manner to minimize moisture losses, and may be taken and prepared independently of the gross samples collected for the determinations of heating value (B. T. U.), ash and other specified data. If the analysis of the special sample shows a moisture content in excess of the contractor's guaranty, a proportionate deduction is made for the price to be paid for the coal.

Copies of this bulletin may be obtained by addressing the Director, Bureau of Mines, Washington, D. C.

A report from New Orleans quotes E. H. Merrick of Chicago, vice-president, as saying that the American Fruit & Steamship Co., which was organized some time ago by Guido A. Kornsdorffer, will within a month engage in the tropical fruit trade between New Orleans and Central American ports. John Beninato will be president and H. S. Renshaw secretary-treasurer. The company will charter steamers.

## SUPPLY AND MACHINERY MEN.

## Wide Interest in the Triple Joint Convention Next Month at Indianapolis.

The three days' sessions, April 10-12, at Indianapolis, Ind., of the triple joint convention of the National Supply and Machinery Dealers' Association, the Southern Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association will interest a large number of firms and individuals in all parts of the country. The program was sketched in last week's issue of the MANUFACTURERS RECORD. The widely ramified influences centering in the gathering are indicated in the following lists of officers and members of the three associations.

## Southern Supply and Machinery Dealers' Association.

President, S. M. Price of the S. M. Price Machinery Co., Norfolk, Va.; vice-presidents, I. F. Young of the Young & Vann Supply Co., Birmingham, Ala., and John A. Harvin of the Peden Iron & Steel Co., Houston, Tex.; secretary and treasurer, Alvin M. Smith of the Smith-Courtney Company, Richmond, Va.

## Alabama.

Anniston Hardware Co., Anniston  
Geo. E. Lum Machinery & Supply Co., Birmingham  
Young & Vann Supply Co., Birmingham  
Turner Supply Co., Mobile  
Alabama Machinery & Supply Co., Montgomery  
Lum Machinery & Supply Co., Montgomery

## Arkansas.

Arkansas Mill Supply Co., Pine Bluff

## Florida.

Bald Hardware Co., Gainesville  
Cameron & Barkley Co., Jacksonville  
Georgia Supply Co., Jacksonville  
Savannah Supply Co., Jacksonville  
John G. Christopher Co., Jacksonville  
H. E. Proof Machinery Co., Jacksonville  
W. A. Ray Hardware Co., Inc., Pensacola  
Cameron & Barkley Co., Tampa  
Georgia Supply Co., Tampa  
Knight & Wall Co., Tampa

## Georgia.

Albany Mill Supply Co., Albany  
Cotton States Belting & Supply Co., Atlanta  
Lombard Iron Works & Supply Co., Augusta  
Butts-Dubberly Hardware Co., Brunswick  
Bush-Phillips Hardware Co., Columbus  
Mallory Mill Supply Co., Macon  
J. S. Schofield's Sons Co., Macon  
Batterey Machinery Co., Rome  
Georgia Supply Co., Savannah  
Savannah Supply Co., Savannah  
J. D. Weed & Co., Savannah

## Illinois.

Reed Hardware & Mfg. Co., Cairo

## Louisiana.

Brown-Roberts Hardware & Supply Co., Ltd., Alexandria  
Weeks Iron Works & Supply Co., Monroe  
A. Baldwin & Co., Ltd., New Orleans  
Gibbons & Stream, New Orleans  
J. H. Menge & Sons, Ltd., New Orleans  
Woodward-Wight & Co., New Orleans

## Maryland.

The Fairbanks Co., Baltimore  
Fred C. Dreyer Supply Co., Cumberland

## Mississippi.

Komp Machine Works, Hattiesburg

## North Carolina.

Charlotte Supply Co., Charlotte  
Textile Mill Supply Co., Charlotte  
Ozell Hardware Co., Greensboro  
Hymen Supply Co., Newbern  
Newbern Iron Works & Supply Co., Newbern  
Harris Hardware Co., Washington  
McKee-Richardson Hardware Co., Washington  
Hymen Supply Co., Wilmington  
Standard Supply Co., Wilmington

## Oklahoma.

Russell Hardware Co., McAlester  
Mideke Supply Co., Oklahoma City

## South Carolina.

Sullivan Hardware Co., Anderson  
Ratley-Lobby Co., Charleston  
Cameron & Barkley Co., Charleston

Columbia Supply Co., Columbia  
Gibbons Machinery Co., Columbia  
Kaminski Hardware Co., Georgetown  
Carolina Supply Co., Greenville  
Montgomery & Crawford, Spartanburg

## Tennessee.

Mitchell-Powers Hardware Co., Bristol  
Mills & Lupton, Inc., Chattanooga  
James Supply Co., Chattanooga  
Summers-Parrott Hardware Co., Johnson City  
C. M. McClung & Co., Inc., Knoxville  
Tennessee Mill & Mine Supply Co., Knoxville  
E. C. Atkins & Co., Memphis  
Livermore Iron Store, Memphis  
N. O. Nelson Co., Memphis  
Pidgeon-Thomas Iron Co., Memphis  
Reed & Ducker, Memphis  
The Beechman-Crosby Co., Memphis  
Kelth, Simmons & Co., Memphis

## Texas.

Walter Tipps, Austin  
E. L. Wilson Hardware Co., Beaumont  
Briggs-Weaver Machinery Co., Dallas  
Peden Iron & Steel Co., Houston  
Lufkin Foundry & Machine Co., Lufkin  
Hardwick-Etter Hardware Co., Sherman

## Virginia.

S. M. Price Machinery Co., Norfolk  
Southern Supply Co., Norfolk  
W. M. Whaley & Co., Norfolk  
John D. Westbrook, Inc., Norfolk  
The Henry Walke Co., Norfolk  
Appomattox Iron Works & Supply Co., Petersburg  
The Charles Leonard Hardware Co., Petersburg  
Stockell-Myers Hardware Co., Petersburg  
Stratton & Bragg Co., Petersburg  
Price Hardware Co., Inc., Pulaski  
Hunter B. Frischkorn, Richmond  
James McGraw, Richmond  
Smith-Courtney Co., Richmond  
Southern Railway Supply Co., Richmond

## West Virginia.

Bluefield Hardware Co., Bluefield  
Superior Supply Co., Bluefield  
Capital City Supply Co., Charleston  
Banks Supply Co., Huntington  
The Miller Supply Co., Huntington  
Danner Mfg. & Supply Co., Weston

## National Supply and Machinery Dealers' Association.

President, W. L. Rodgers of the Pittsburgh Gauge & Supply Co., Pittsburgh, Pa.; vice-presidents, Henry Prentiss of the Prentiss Tool & Supply Co., New York, and J. O. Harron of Harron, Rickard & McCone, San Francisco; secretary-treasurer, Thos. A. Fernley of Philadelphia, and advisory secretary-treasurer, T. James Fernley of Philadelphia.

## Arizona.

Roy & Titecomb, Nogales  
Albert Steinfeld & Co., Tucson

## California.

Ducommun Hardware Co., Los Angeles  
Harron, Rickard & McCone, Los Angeles  
Mine & Smelter Supply Co., Los Angeles  
Pacific Const Mfg. Co., Los Angeles  
Smith-Booth-Usher Co., Los Angeles  
Warren & Bailey Mfg. Co., Los Angeles  
Union Well Supply Co., Los Angeles  
Hazard-Gould Co., San Diego  
E. C. Atkins Co., San Francisco  
Harron, Rickard & McCone, San Francisco  
Pacific Tool & Supply Co., San Francisco

## Colorado.

The Morse Bros. Machinery & Supply Co., Denver  
Mine & Smelter Supply Co., Denver

## Connecticut.

The C. S. Mersick & Co., New Haven

## Illinois.

W. D. Allen Mfg. Co., Chicago  
Chas. H. Besly & Co., Chicago  
McMaster Carr Supply Co., Chicago  
Machinery Supply Co., Chicago  
Manning, Maxwell & Moore, Chicago  
Sehansen, Wehrs & Co., Chicago  
The H. A. Stocker Machinery Co., Chicago

## Indiana.

The National Mill Supply Co., Fort Wayne  
Fort Wayne Oil & Supply Co., Fort Wayne  
E. C. Atkins & Co., Indianapolis  
Central Rubber & Supply Co., Indianapolis  
Hilde & Leather Belting Co., Indianapolis  
Indianapolis Belting & Supply Co., Indianapolis  
Van Camp Hardware & Iron Co., Indianapolis  
Vonnegut Hardware Co., Indianapolis

## Iowa.

Louis Haussens's Sons, Inc., Davenport  
Globe Machinery & Supply Co., Des Moines

## Kentucky.

Brandels Machinery & Supply Co., Louisville  
W. H. Nell & Co., Louisville

## Massachusetts.

Chandler & Farquhar Co., Boston  
Cutter & Wood Supply Co., Boston  
S. H. Davis Co., Boston  
Grant Nail & Supply Co., Boston  
Prentiss Tool & Supply Co., Boston  
Rawles-Cobb Co., Boston  
Collins Hardware Co., Lynn  
Parris-Kenyon Co., Pittsfield  
The Pierce Hardware Co., Taunton  
Dunn & Goodell Co., Worcester

## Michigan.

Central Distributing Co., Detroit  
T. B. Rayl Co., Detroit  
Chas. A. Strellinger Co., Detroit  
The Boyer Campbell Co., Detroit  
C. C. Warner Machinery Co., Detroit  
McMullen Machinery Co., Grand Rapids  
The Factory Supplies Co., Lansing  
Northern Hardware & Supply Co., Menominee

## Minnesota.

Marshall Wells Hardware Co., Duluth  
Robinson, Cary & Sands Co., St. Paul  
Northern Machinery Co., Minneapolis  
Frank E. Satterlee Co., Minneapolis

## Missouri.

H. J. Brunner Metal & Machinists' Supply Co., Kansas City  
Bunting Stone Hardware Co., Kansas City  
English Tool & Supply Co., Kansas City  
Colcord-Wright Machinery Co., St. Louis  
Geller, Ward & Hasner Hardware Co., St. Louis

## Montana.

Missoula Mercantile Co., Missoula

## Nebraska.

C. A. Newberry, Alliance  
Sunderland Machinery & Supply Co., Omaha

## New York.

Ellis W. Morse & Co., Binghamton  
Reas & Co., Buffalo  
Bickford & Francis Belting Co., Buffalo  
Root, Neal & Co., Buffalo  
Weed & Co., Buffalo  
Clark Hardware Co., Jamestown  
James Beggs & Co., New York city  
M. Eberhart & Sons Co., New York city  
Peter A. Frasse & Co., New York city  
Manning, Maxwell & Moore, Inc., New York city  
Mine & Smelter Supply Co., New York city  
Montgomery & Co., New York city  
Patterson, Gottfried & Hunter, Ltd., New York city  
George Pfaff, New York city  
Prentiss Tool & Supply Co., New York city  
Vandyck-Churchill Co., New York city  
Walls, Bray & Co., New York city  
Elderfield Hartshorn Co., Niagara Falls  
P. N. Heryon Hardware Co., Oswego  
Louis Ernst & Sons, Rochester  
The M. I. Hibbler Machine Supply Co., Rochester  
Syracuse Supply Co., Syracuse

## Ohio.

The Hardware & Supply Co., Akron  
The Boehinger Hardware Co., Cincinnati  
The V. N. Devon Supply Co., Cincinnati  
The Wm. T. Johnston Co., Cincinnati  
The E. A. Kinsey Co., Cincinnati  
E. K. Morris & Co., Cincinnati  
The Pickering Hardware Co., Cincinnati  
The Queen City Supply Co., Cincinnati  
The Wirthlin-Mann Co., Cincinnati  
The W. Bingham Co., Cleveland  
The Cleveland Tool & Supply Co., Cleveland  
The Lake Erie Nail & Supply Co., Cleveland  
The Lockwood-Leutkemeyer-Henry Co., Cleveland  
Mau Sherwood Supply Co., Cleveland  
The Motch & Merryweather Machinery Co., Cleveland  
The W. M. Pattison Supply Co., Cleveland  
Strong, Carlisle & Hammond Co., Cleveland  
The White Tool & Supply Co., Cleveland  
The Geo. Worthington Co., Cleveland  
Columbus Mill & Mine Supply Co., Columbus  
Potts-Rine Co., Columbus  
Barnes Mfg. Co., Mansfield  
Evans Supply Co., Newark  
The Standard Supply Co., Portsmouth  
The Bostwick Braun Co., Toledo  
The M. I. Wilcox Co., Toledo  
The Stanbaugh-Thompson Co., Youngstown

## Oklahoma.

Welch Wholesale Hardware Co., Clinton

## Oregon.

Zimmerman-Wells Brown Co., Portland  
E. C. Atkins & Co., Portland  
Marshall Wells Hardware Co., Portland

## Pennsylvania.

Albright Son & Co., Allentown  
W. H. Taylor & Co., Allentown  
Erie Mfg. & Supply Co., Erie  
Northwestern Pipe & Supply Co., Erie  
Hazleton Machinery & Supply Co., Hazleton  
C. H. Miller Hardware Co., Huntingdon  
Swank Hardware Co., Johnstown  
Horr & Co., Lancaster  
Rolly Bros. & Raub, Lancaster  
Steinman Hardware Co., Lancaster  
George Krause Hardware Co., Lebanon  
Charles Bond Co., Philadelphia  
Maddock & Co., Philadelphia  
Powell, Clouds & Co., Philadelphia  
W. E. Shipley Machinery Co., Philadelphia  
Standard Supply & Equipment Co., Philadelphia

Swind Machinery Co., Philadelphia  
Wm. P. Walters Sons, Philadelphia  
Vandyck-Churchill Co., Philadelphia  
Frank Toomey, Inc., Philadelphia  
Bailey Farrell Mfg. Co., Pittsburgh  
Baird Machinery Co., Pittsburgh  
Brown & Zortman Machinery Co., Pittsburgh  
H. L. Childs Co., Pittsburgh  
Frick & Lindsay Co., Pittsburgh  
The Hukill-Hunter Co., Pittsburgh  
Johnston-Morehouse-Dickey Co., Pittsburgh  
Laughlin Barney Machinery Co., Pittsburgh  
Machinists' Supply Co., Pittsburgh  
Pittsburgh Gauge & Supply Co., Pittsburgh  
Somers, Fittler & Todd Co., Pittsburgh  
Joseph Woodwell Co., Pittsburgh  
Bright & Co., Reading  
Stichter Hardware Co., Ltd., Reading  
Blitzender Co., Scranton  
The Scranton Supply & Machinery Co., Scranton  
Ralph E. Weeks Co., Scranton  
Kline & Co., Williamsport

## Rhode Island.

Wm. K. Toole Hardware Co., Pawtucket

## South Carolina.

The Cameron & Barkley Co., Charleston

## Tennessee.

E. C. Atkins & Co., Memphis

## Utah.

The Salt Lake Hardware Co., Salt Lake City  
Mine & Smelter Supply Co., Salt Lake City

## Washington.

Puget Sound Machinery Depot, Seattle

## West Virginia.

Baldwin Chandler Supply Co., Elkins  
Trimble & Lutz Supply Co., Wheeling

## Wisconsin.

Schlafer Hardware Co., Appleton  
O. L. Packard Machinery Co., Milwaukee  
Philip Gross Hardware Co., Milwaukee  
Western Iron Stores Co., Milwaukee  
Hoernel Hardware Co., Racine

## American Supply and Machinery Manufacturers' Association.

President, N. A. Gladding of E. C. Atkins & Co., Inc., Indianapolis, Ind.; vice-presidents, D. K. Swartwout of the Ohio Blower Co., Cleveland, O.; C. H. Jenkins of the Moran Flexible Steam Joint Co., Louisville, Ky., and Farnham Yardley of Jenkins Bros., New York; secretary-treasurer, F. D. Mitchell of New York.

Alexander Bros., Philadelphia, Pa.  
American Blower Co., Detroit, Mich.  
American Bolt Co., Birmingham, Ala.  
American District Steam Co., N. Tonawanda, N. Y.

The American Fabric Belting Co., Cleveland, O.  
American Injector Co., Detroit, Mich.  
American Iron & Steel Mfg. Co., Lebanon, Pa.  
The American Pulley Co., Philadelphia, Pa.  
American Sawmill Machinery Co., Hackettstown, N. J.

American Screw Co., Providence, R. I.  
American Sheet & Tin Plate Co., Pittsburgh, Pa.  
American Steam Packing Co., Boston, Mass.  
American Steam Pump Co., Battle Creek, Mich.

American Steel & Wire Co., Chicago, Ill.  
Appleton Car Mover Co., Appleton, Wis.  
Armstrong Bros. Tool Co., Chicago, Ill.  
The Atha Tool Co., Newark, N. J.  
E. C. Atkins & Co., Inc., Indianapolis, Ind.  
The Ray State Tap & Die Co., Mansfield, Mass.



Best Manufacturing Co.....Pittsburgh, Pa.  
 Bond Foundry & Machine Co.....Manheim, Pa.  
 Bonner & Barnwell, Inc.....New York, N. Y.  
 Boston Belting Co.....Boston, Mass.  
 Boston Woven Hose & Rubber Co.,  
 Boston, Mass.  
 Broderick & Bascom Rope Co., St. Louis, Mo.  
 The Bradford Belting Co.....Cincinnati, O.  
 Brown & Sharpe Mfg. Co.....Providence, R. I.  
 Buffalo Forge Co.....Buffalo, N. Y.  
 Buffum Tool Co.....Louisiana, Mo.  
 Burr Oak Belting Co.....Cincinnati, O.  
 The Burt Manufacturing Co.....Akron, O.  
 Butterfield & Co.....Derby Line, Vt.  
 A. S. Cameron Steam Pump Works,  
 New York, N. Y.  
 The Carborundum Co.....Niagara Falls, N. Y.  
 S. W. Card Mfg. Co.....Mansfield, Mass.  
 The Canton-Hughes Pump Co.....Wooster, O.  
 J. M. Carpenter Tap & Die Co.,  
 Pawtucket, R. I.  
 Chain Belt Co.....Milwaukee, Wis.  
 Charlotte Leather Belting Co.,  
 Charlotte, N. C.  
 A. W. Chesterton Co.....Boston, Mass.  
 Chicago Belting Co.....Chicago, Ill.  
 Chicago Flexible Shaft Co.....Chicago, Ill.  
 The Chisholm & Moore Mfg. Co.,  
 Cleveland, O.  
 The Cincinnati Rubber Mfg. Co.,  
 Cincinnati, O.  
 The Cincinnati Tool Co.....Cincinnati, O.  
 Jas. Clark, Jr., Electric Co.....Louisville, Ky.  
 Clayton & Lambert Mfg. Co.....Detroit, Mich.  
 Cleveland Twist Drill Co.....Cleveland, O.  
 Clipper Belt Lacer Co.....Grand Rapids, Mich.  
 The Corbin Screw Corporation,  
 New Britain, Conn.  
 The Crescent Machine Co.....Leetonia, O.  
 The Curtis & Curtis Co.....Bridgeport, Conn.  
 W. O. Davey & Sons.....Jersey City, N. J.  
 Delta File Works.....Philadelphia, Pa.  
 The Deming Co.....Salem, O.  
 J. Milton Hagy Waste Works,  
 Philadelphia, Pa.  
 Detroit Lubricator Co.....Detroit, Mich.  
 Detroit Oak Belting Co.....Detroit, Mich.  
 Detroit Twist Drill Co.....Detroit, Mich.  
 Diamond Saw & Stamping Works,  
 Buffalo, N. Y.  
 R. & J. Dick, Ltd.....Passaic, N. J.  
 Henry Disston & Sons, Inc., Philadelphia, Pa.  
 Dodge Mfg. Co.....Mishawaka, Ind.  
 R. R. Donnelly & Sons Co.....Chicago, Ill.  
 Du Bois Iron Works.....Du Bois, Pa.  
 The Duff Mfg. Co.....Pittsburgh, Pa.  
 Eagle Glass & Mfg. Co.....Wellburg, W. Va.  
 The Eclipse Wood Pulley Co., Inc., Berlin, Pa.  
 Elliott Co.....Pittsburgh, Pa.  
 Fabric Fire Hose Co.....New York, N. Y.  
 The Fisher Governor Co.....Marshalltown, Ia.  
 Flintkote Manufacturing Co.....Boston, Mass.  
 Fisher & Norris.....Trenton, N. J.  
 Ford Chain Block & Mfg. Co.,  
 Philadelphia, Pa.  
 Frictionless Metal Co.....Chattanooga, Tenn.  
 The Gardner Governor Co.....Quincy, Ill.  
 The M. Garland Co.....Bay City, Mich.  
 The Garland Nut & Rivet Co., Pittsburgh, Pa.  
 General Asbestos & Rubber Co.,  
 Charleston, S. C.  
 The Glacier Metal Co.....Richmond, Va.  
 Graham Nut Co.....Pittsburgh, Pa.  
 Graton & Knight Mfg. Co.....Worcester, Mass.  
 Greene, Tweed & Co.....New York, N. Y.  
 Edwin Harrington, Son & Co., Inc.,  
 Philadelphia, Pa.  
 William H. Haskell Mfg. Co., Pawtucket, R. I.  
 The Hayden-Corbett Chain Co., Columbus, O.  
 Clinton E. Hobbs.....Boston, Mass.  
 Hoggson & Pettis Mfg. Co., New Haven, Conn.  
 Home Rubber Co.....Trenton, N. J.  
 Homestead Valve Mfg. Co., Pittsburgh, Pa.  
 The Houston, Stanwood & Gamble Co.,  
 Cincinnati, O.  
 Hussey-Binns Shovel Co.....Pittsburgh, Pa.  
 The Jeffrey Mfg. Co.....Columbus, O.  
 Jenkins Bros.....New York City  
 Jewell Belting Co.....Hartford, Conn.  
 H. W. Johns-Manville Co.....New York, N. Y.  
 Johnson Belting Co.....New York, N. Y.  
 Keasbey & Mattison Co.....Ambler, Pa.  
 The Kelly & Jones Co.....Greensburg, Pa.  
 The Keystone Mfg. Co.....Buffalo, N. Y.  
 The Knight Mfg. Co.....Canton, O.  
 La Belle Iron Works.....Steubenville, O.  
 Estate Edward R. Ladew.....Glen Cove, N. Y.  
 Lake Erie Iron Co.....Cleveland, O.  
 Lebanon Valley Iron & Steel Co.,  
 Lebanon, Pa.  
 A. Leschen & Sons Rope Co., St. Louis, Mo.  
 Lincoln-Williams Twist Drill Co.,  
 Taunton, Mass.  
 J. E. Lonergan Co.....Philadelphia, Pa.  
 The Ludlow Valve Mfg. Co.....Troy, N. Y.  
 The Lufkin Rule Co.....Saginaw, Mich.  
 The Lunkheimer Co.....Cincinnati, O.  
 Magnolia Metal Co.....New York, N. Y.  
 The Manhattan Rubber Mfg. Co.,  
 Passaic, N. J.  
 Mannheim Mfg. & Belting Co., Manheim, Pa.  
 Manufacturers' Belt Hook Co., Chicago, Ill.  
 Mark Manufacturing Co.....Chicago, Ill.

Massachusetts Saw Works.....Springfield, Mass.  
 McCord Manufacturing Co.....Detroit, Mich.  
 The John H. McGowan Co.....Cincinnati, O.  
 The McRae & Roberts Co.....Detroit, Mich.  
 The Mechanical Rubber Co.....Cleveland, O.  
 Medart Patent Pulley Co.....St. Louis, Mo.  
 The Mooney Belting Co.....Cincinnati, O.  
 Moran Flexible Steam Joint Co.,  
 Louisville, Ky.  
 Frank Mossberg Co.....Attleboro, Mass.  
 The National Supply Co.....Baltimore, Md.  
 N. J. Car Spring & Rubber Co.,  
 Jersey City, N. J.  
 New York Belting & Packing Co.,  
 New York City  
 New York Leather Belting Co.,  
 New York City  
 New York Rubber Co.....New York, N. Y.  
 Nicholson File Co.....Providence, R. I.  
 Charles Nidner's Sons Co.....Malden, Mass.  
 The Noera Mfg. Co.....Waterbury, Conn.  
 Nordyke & Marmon Co.....Indianapolis, Ind.  
 Norristown Magnesia & Asbestos Co.,  
 Norristown, Pa.  
 Norton Co.....Worcester, Mass.  
 The Ohio Blower Co.....Cleveland, O.  
 The Ohio Valley Pulley Works,  
 Maysville, Ky.  
 The Jas. Ohlen & Sons Saw Mfg. Co.,  
 Columbus, O.  
 The Oliver Iron & Steel Co., Pittsburgh, Pa.  
 Olmsted-Flint Co.....New York, N. Y.  
 Oneida Steel Pulley Co.....Oneida, N. Y.  
 Orr & Sembower, Inc.....Reading, Pa.  
 N. Palmer & Co.....Bridgeport, Conn.  
 The Charles Parker Co.....Meriden, Conn.  
 Peek, Stow & Wilcox Co., Southington, Conn.  
 Peerless Rubber Mfg. Co.....New York City  
 Penberthy Injector Co.....Detroit, Mich.  
 Pennsylvania Shafting Co., Spring City, Pa.  
 Pennsylvania Wire Glass Co.,  
 Philadelphia, Pa.  
 Henry K. Porter.....Everett, Mass.  
 The Wm. Powell Co.....Cincinnati, O.  
 P. Prybill Machine Co., Inc., New York, N. Y.  
 Reeves Pulley Co.....Columbus, Ind.  
 The Reliance Gauge Column Co.,  
 Cleveland, O.  
 Republic Iron & Steel Co.....Youngstown, O.  
 The Republic Rubber Co.....Youngstown, O.  
 Revere Rubber Co. of N. Y., New York City  
 Clement Restein Co.....Philadelphia, Pa.  
 J. E. Rhoads & Sons.....Philadelphia, Pa.  
 Roberts Brass Mfg. Co.....Detroit, Mich.  
 Pennsylvania Flexible Metallic Tubing Co.,  
 Philadelphia, Pa.  
 Roe Stephens Mfg. Co.....Detroit, Mich.  
 Rogersford Foundry & Machine Co.,  
 Philadelphia, Pa.  
 Russell, Burdall & Ward Bolt & Nut Co.,  
 Port Chester, N. Y.  
 Saginaw Mfg. Co.....Saginaw, Mich.  
 Sawyer Belting Co.....Cleveland, O.  
 Chas. A. Schieren Co.....New York, N. Y.  
 H. B. Sherman Mfg. Co., Battle Creek, Mich.  
 Sherwood Manufacturing Co., Buffalo, N. Y.  
 Simonds Mfg. Co.....Fitchburg, Mass.  
 The Sinker-Davis Co.....Indianapolis, Ind.  
 Skillin & Richards Mfg. Co.....Chicago, Ill.  
 The Skinner Chuck Co., New Britain, Conn.  
 Standard Chain Co.....Pittsburgh, Pa.  
 Standard Paint Co.....New York City  
 Standard Pressed Steel Co., Philadelphia, Pa.  
 The Standard Tool Co.....Cleveland, O.  
 The Sterling & Skinner Mfg. Co.,  
 Detroit, Mich.  
 Stockham Pipe & Fittings Co.,  
 Birmingham, Ala.  
 George Stratford Onkum Co.,  
 Jersey City, N. J.  
 Thermold Rubber Co.....Trenton, N. J.  
 Thomas Grate Bar Co.....Birmingham, Ala.  
 The Turner Brass Works.....Sycamore, Ill.  
 Union Belt Co.....Fall River, Mass.  
 Union Manufacturing Co., New Britain, Conn.  
 Union Steam Pump Co., Battle Creek, Mich.  
 United States Graphite Co., Saginaw, Mich.  
 The Upson Nut Co.....Cleveland, O.  
 Valley Iron Works.....Williamsport, Pa.  
 Vixen Tool Co.....Philadelphia, Pa.  
 Voorhees Rubber Mfg. Co., Jersey City, N. J.  
 Warren Lubricant Co.....New York, N. Y.  
 L. S. Watson Mfg. Co.....Leicester, Mass.  
 Wausan Sandpaper Co.....Wausan, Wis.  
 Hugo Weidmann.....New Orleans, La.  
 Wells Bros. Co.....Greenfield, Mass.  
 The Western Tool & Mfg. Co.,  
 Springfield, Mass.  
 J. B. Williams & Sons.....Dover, N. H.  
 J. H. Williams & Co.....Brooklyn, N. Y.  
 The D. T. Williams Valve Co., Cincinnati, O.  
 The Wolf Co.....Chambersburg, Pa.  
 T. B. Wood's Sons Co.....Chambersburg, Pa.  
 Woodhouse Chain Works.....Trenton, N. J.  
 Worcester Pressed Steel Co., Worcester, Mass.  
 Wyoming Shovel Works.....Wyoming, Pa.  
 The Yale & Towne Mfg. Co., New York City  
 Youngstown Sheet & Tube Co.,  
 Youngstown, O.  
 Tubular Rivet & Stud Co.....Boston, Mass.

## The Birmingham Iron Market.

[Special Cor. Manufacturers Record.]

Birmingham, Ala., March 22.

With the present level of pig-iron prices quite undetermined, and more or less apprehension being manifested as to the result of the heavy rate of production that is being maintained, when compared with the comparatively small tonnage recently entered for future delivery, the attention of those concerned is quite naturally turned to the industrial situation in general. In this the conditions that have existed for some months past are apparently unchanged. Practically the entire foundry capacity in the South is being operated, and in the majority of cases the raw material engaged is being received at the rate agreed upon. The extent of the stock accumulation is not definitely known, but there is no reason to believe that the surplus on hand is larger than carried ordinarily. The market for the several foundry products is apparently in a very healthy condition. Advances made in prices have generally been maintained, and the volume of new business in sight is considered sufficient to warrant steady operation at all plants during the summer months. The cast-iron pipe manufacturers have probably booked a smaller volume of business in the past 30 days than was expected; however, more large contracts are now under consideration than at any time for some months past, and the producers have not seen fit in any case to curtail the output, notwithstanding the accumulation of the finished product. Stove foundries are considerably behind with deliveries; agricultural implement manufacturers have cleaned up the stocks accumulated during the winter season, while foundries producing car wheels, brake shoes and a general line of castings are forwarding a maximum tonnage. Local machine shops are being taxed to take care of the requirement for furnace and mine operations, and sufficient new work is under way to take care of the forces at the structural material shops. In addition to the operations referred to, a large force of men and an attractive volume of material is required for the several improvements and extensions that are under way, and as has been mentioned previously, the erection of one large foundry plant and two smaller plants is soon to be commenced. As is indicated by the number of active blast furnaces, both coal and ore-mining operations are probably more extensive than at any time in the past three years, and with such activities the railroads, of course, require large forces, and necessarily consume a larger tonnage of raw material for repairs. In view of such conditions, the outlook in all quarters is encouraging, and the feeling that generally prevails is affected accordingly; but the fact remains that very little raw material is being provided for future requirements, and that in the meantime the pig-iron market, upon which the majority of operations are dependent, continues to weaken.

The sales of foundry iron in the week just ended are no larger than of the week previous, with just as much variance in price consideration. Lots of 500 tons each for prompt shipment sold as low as \$13 per ton at Birmingham for No. 2 foundry, while no higher price was received for several carloads of the same grade. For special analysis contents and favorite brands \$13.50 per ton, and even \$14 per ton, has been paid for No. 2 soft, but where resale iron was offered in competition the prices made were governed largely by the several local conditions. As a result of this disposition on the part of the furnace companies, de-

cidedly less is heard of the resale offerings. Inquiries being received are quite of an indefinite nature, which is true of the larger consumers as well as the small concerns. In fact, no tonnage is being engaged in any case other than for immediate requirement, and it is not believed that lower quotations by the furnace companies would stimulate the demand just at this time. The tonnage being moved still compares favorably with the forwardings for the two months previous, but without a change in furnace operations the aggregate accumulation will no doubt show a substantial increase on April 1. On that date the adjustment of contracts will be in order, and the result is being awaited with interest. It is generally understood that the furnaces are carrying a very significant tonnage that should have been delivered previously, and it is largely a matter of cancelling the unfilled tonnage and allowing the purchasers to re-enter the market that is to be decided. In the meantime, the tonnage being received on old and high-priced contracts is limited to the requirement, and new contracts are being withheld pending the adjustment of prices that is expected with the expiration of the first quarter of the year. Until the market is more active and a firm basis for quotations has been adopted by the producing interests the several grades can only be quoted nominally as follows per gross ton f. o. b. cars at Birmingham district furnaces, viz.: No. 1 foundry, \$14 to \$14.50; No. 2 foundry, \$13.25 to \$13.75; No. 3 foundry, \$13 to \$13.50; No. 4 foundry, \$12.75 to \$13; gray forge, \$12.50 to \$12.75; mottled, \$12.50 to \$12.75.

The position of local finishing mill operators is more comfortable than for some months past, owing to the extent to which unfilled orders have been reduced. There is still sufficient unfilled specifications to take care of the output for some months, but the tonnage available for spot delivery is larger, and the prices being received for such tonnage are more satisfactory than for the contract deliveries. An extension to the Alabama City (Ala.) mill is under consideration, and at Anniston, Ala., a part of the plant formerly operated by the Western Steel Car & Foundry Co. has been rehabilitated by the Kilby Locomotive & Machine Co.

The condition of the cast-iron pipe market is practically the same as last reported, no transactions of importance having been recorded in the week. Several large requirements are being considered, but the date of letting of small tonnages only has been advertised for the near future. Quotations as last revised are being maintained for the business placed, and we continue to quote as below, per net ton, f. o. b. cars at Birmingham foundries, viz.: Four-inch water pipe, \$23.50; six-inch water pipe and larger sizes, average \$21.50 per ton, with an advance of \$1 per ton asked for gas pipe. Special fittings are quotable at \$45 to \$50 per net ton at foundry. These quotations are probably subject to shading for large municipal contracts, but are firm for small orders for prompt shipment.

The old material market is very quiet, with prices inclined toward a lower basis. All grades of cast scrap are 25 cents to 50 cents per ton lower than at the time of last report, and very little tonnage changed hands during the week. Shipments against contracts are still being deferred in certain directions, owing to the accumulations of stocks on consumers' yards, and inquiries involve carloads only. In the absence of trading, quotations cannot be revised with accuracy, and the schedule below is considered only a nominal representative of

values. Dealers' asking prices are, per gross ton, f. o. b. cars here, viz.:

Old iron rails (light), \$15.50 to \$16.  
Old steel axles (light), \$15.50 to \$16.  
Old iron rails, \$15.50 to \$16.  
No. 1 railroad wrought, \$13.50 to \$14.  
No. 2 railroad wrought, \$11 to \$11.50.  
No. 1 country, \$9.50 to \$10.  
No. 2 country, \$8.50 to \$9.  
No. 1 machinery, \$11.50 to \$12.  
No. 1 steel, \$11.50 to \$12.  
Tram car wheels, \$11 to \$11.50.  
Standard car wheels, \$12.50 to \$13.

### La Fourche Drainage.

Chamber of Commerce,  
Monroe, La., March 20.

Editor Manufacturers Record:

The executive committee appointed at the recent conference here to devise ways and means to drain the great La Fourche basin and thus throw open for cultivation a vast empire of rich land, and to greatly improve health conditions throughout the district, organized this week with W. T. Couper, Doss, president; Wiley Roberts, Girard, and N. M. Davis, Columbia, vice-presidents; G. A. Petrie, Monroe, secretary; H. D. Apgar, Monroe, treasurer; Sandel & Clark, Monroe, attorneys; R. L. Morris, Jr., Monroe, engineer, and Victor C. Barringer, Monroe, chairman of the executive committee. Capt. L. N. Polk of Bastrop gave some interesting figures on the drainage district. He estimated that a total of 428,000 acres of land would be drained by the proposed main canal and laterals as follows:

South of the Vicksburg, Shreveport & Pacific Railroad in Ouachita parish, 66,000 acres; Caldwell parish, 40,000; Richland parish, 55,000; total 161,000 acres; north of the Vicksburg, Shreveport & Pacific Railroad, Ouachita parish, 26,000 acres; Richland parish, 21,000; Morehouse parish, 155,000; Morehouse east of the Bonne Idee, 65,000 acres; total 267,000 acres—making a grand total of 428,000 acres of rich, fertile agricultural lands which will be brought into a high state of cultivation by the reclamation of these lands. LUTHER ELLISON, Secretary.

### Port Tampa Coal Terminals.

J. W. Morris, general forwarding agent Atlantic Land & Improvement Co., Port Tampa, Fla., writes to the MANUFACTURERS RECORD:

"The coal dock on which elevator is to be located is being rebuilt, and will be ready within the next few weeks for installing the machinery. The material, etc., is being assembled, and I think the new plant will be in operation by June. The superstructure will be of iron and steel throughout; single bridge tramway supported by two towers and spanning full width of dock, approximately 250 feet. The whole superstructure will have unity movement up and down the dock by its own power, distance of approximately 700 feet; operated by steam. Will handle coal in two-ton clamshell or dump bucket, interchangeable. Will have handling capacity of 100 tons per hour. Storage capacity of coal on dock approximately 20,000 tons. This plant will be operated in the handling of coal, discharging from vessels and loading into cars or storing on dock, taking coal from dock and loading into cars or into vessels. Approximate cost of the new plant, \$50,000."

### Bonuses for Factories.

Business Men's Club.

Waco, Tex., March 15.

Editor Manufacturers Record:

The Waco Business Men's Club has decided to raise \$100,000 to be offered as bonus to secure desirable manufacturing enterprises for Waco.

E. F. DRAKE, Secretary.

## GOOD ROADS

### WEEK'S HIGHWAY RECORD.

#### Progress in Southern Road and Street Improvement.

[Further details of highway undertakings and bond issues mentioned below are given under the headings Construction Department and New Securities, published elsewhere in this issue.]

#### Bonds Voted.

Cullman, Ala.—Cullman county voted bond issue of \$200,000 for road construction.

Fort Myers, Fla.—City voted \$47,000 bonds for street paving.

Plant City, Fla.—City voted \$35,000 bonds for paving.

Valley Mills, Tex.—Bosque county voted \$40,000 bonds for construction of about 30 miles of roads.

Winnie, Tex.—Commissioners precinct No. 4 of Chambers county voted \$100,000 bonds to build and shell roads.

#### Bonds to Be Voted.

Cameron, Tex.—Justice Precinct No. 1 of Milam county will vote on \$150,000 bonds for road construction.

Gate City, Va.—Johnson, Estville and Fulkerson magisterial districts of Scott county will vote on \$150,000 bonds to construct roads.

Hendersonville, N. C.—Hendersonville county will order bond election in Hendersonville and Hoopers Creek townships to vote on \$50,000 and \$20,000 bonds, respectively, for road construction.

Iberia, La.—Iberia parish will vote late in April or early in May on issuance of \$120,000 for road construction.

Parkersburg, W. Va.—City votes May 8 on \$200,000 bonds for street paving.

Princeton, W. Va.—Mercer county votes April 22 on \$800,000 bonds for permanently improving roads.

Rutherfordton, N. C.—Rutherford county votes April 23 on \$250,000 bonds to construct roads.

Texarkana, Tex.—City will vote on \$250,000 bonds to pave streets, etc.

#### Contracts Awarded.

Birmingham, Ala.—City awarded contracts at \$76,602.90 for street paving.

Bluff City, Tenn.—Sullivan county awarded contract to grade and macadamize 50-mile road.

Choccolocco, Ala.—Goodrich & Crinkley of Anniston, Ala., have contract to construct road in Choccolocco Valley; estimated cost \$18,000.

Morristown, Tenn.—City awarded contract for 16,379 square yards sheet asphalt guttering, grading and paving.

Richmond, Va.—City awarded contracts for about 100,000 square yards granite and smooth paving.

Statesville, N. C.—Iredell county awarded contracts for grading 30 miles of road.

#### Contracts to Be Awarded.

Baltimore, Md.—City receives bids until April 2 for 13,920 square yards vitrified block, 16,650 square yards granite block, 3020 square yards sheet asphalt, 2600 square yards concrete and 2570 square yards vitrified block.

Columbia, S. C.—Richland county will construct road as far as \$18,000 appropriation will permit; probably pave with bitulithic.

Danville, Va.—Pittsylvania county will construct four sections of soil road, about 10 miles each, and 8 miles of macadam road in Dan River district.

Elkton, Md.—Cecil county will construct macadam road; 2½ miles.

Fulton, Mo.—Commissioners Fulton Special Road District will improve about 15 miles of roads.

Gadsden, Ala.—City will construct 1334 square yards concrete sidewalks, 3000 linear feet 8-inch curb and 36-inch gutter, 200 linear feet 6-foot gutter, 200 cubic yards excavation, etc.

Linden, Tex.—Road District No. 7, Cass county, opens bids April 10 to construct clay and sand roads at cost of \$35,000.

Macon, Miss.—Noxubee county will construct about five miles gravel and five miles sand-clay road.

New Iberia, La.—City will pave 12 miles cement sidewalks.

Orange, Va.—Orange county will macadamize about 20 additional roads.

Port Lavaca, Tex.—Calhoun county receives bids March 28 to construct 30 miles of gravel surfaced highway in Road District No. 2.

Tampa, Fla.—City will lay 200,000 square yards vitrified brick pavement.

### MOTOR CAR BUILDING.

#### The Rapid Development of This Industry in the South.

While giant strides are being made in the development of the automobile and motor truck industry in the United States, as strikingly shown in the fact that there are now about 1,000,000 automobiles and 60,000 motor trucks in use in the United States, the South, though active in the purchase of cars, has, until within the last year or two, been backward in the building of cars. Many millions of dollars have been sent out of the South to buy automobiles and motor trucks of every variety and of every grade, from the cheapest to the most expensive. Several Western companies building popular automobiles have been partly financed by Southern investors. Fortunately for the South, there is a disposition now to begin the active development of automobile building in the South, and thus to keep at home some of the millions that have for the last few years annually been sent North and West for automobiles and motor trucks. In various parts of the South automobile plants are making good progress, and in some cases exceptional development has been shown. The South should encourage this home industry to the utmost extent possible.

The latest example of the establishment of a large automobile manufacturing plant in that section is that of the Kline Motor Car Corporation of Richmond, Va., which is actively engaged in turning out four models of pleasure and commercial automobiles, from four cylinders of 30 horse-power to six cylinders of 60 horse-power.

The company was established in Richmond because the management realized the great field for medium-priced high-grade cars in the South and the advantages of this section for automobile manufacture. The company has found that the demand for cars has responded nobly, and the Southern business has increased greatly, until now a large per cent. of the cars built this year will be distributed through the South. The Kline car is designed to be adapted to Southern users in its mechanical construction, to overcome conditions of heavy sand roads and hill-climbing. This has resulted in the demand for a car with ample power and endurance. The company is already considering the building of an addition to its factory, and is daily engaging additional skilled mechanics.

The Marathon Motor Works of Nashville, Tenn., has grown from a \$20,000 organization in 1908 to a \$1,000,000 corporation in 1911, and is now turning out the "Marathon" cars in large numbers and selling them in foreign countries as

well as throughout the United States. Its agencies are extended to South America, Australia, England, South Africa and Cuba, and it is expected that in addition to supplying its home demand, increased exports will be made during 1913. In adopting the name "Marathon" the company determined that its output should live up to the name.

The Norwalk Motor Car Co. of Martinsburg, W. Va., has been manufacturing "Norwalk" cars for the past six years, and moved from Ohio to its West Virginia factory in 1912. This change was marked by the first announcement of its present line of six cylinder, underslung cars. These cars combine the two important principles of construction—the underslung idea and the six-cylinder power plant, which have met with such approval that its business has increased to an extent that has required the company to make arrangements for a considerable increase in output.

The Moon Motor Car Co. of St. Louis is experiencing constant and rapid growth in its business, as signified by the recent statement of Joseph W. Moon, president of the company, that orders are already in for the biggest year's business the company has ever experienced, and that the season is not half over. The company anticipated this demand for Moon cars, and last year considerably increased the size of the plant, resulting in a greater output in every department. Particular attention is paid to the testing department and great care taken to build up a thoroughly efficient organization. Every car is tested for several days before delivery, and this department is kept in operation 24 hours a day, requiring three shifts of eight hours each to keep up with the demand for cars.

Other established Southern makers who take part in supplying the rapidly-growing demand in the South for motor vehicles in various types include the following: The Packers' Motor Truck Co. of Wheeling, W. Va.; the Tulsa Automobile & Manufacturing Co. of Tulsa, Okla.; the Jarvis-Huntington Automobile Co. of Huntington, W. Va.; the Twyford Automobile Manufacturing Co. of Houston, Tex., using the Twyford patents; Carl Spencer's Sons Co., Baltimore; Lord Baltimore Motor Car Corporation, Baltimore, maker of "Lord Baltimore" trucks; the Longest Bros. Co. of Louisville, Ky., maker of "Longest" trucks, and three or four other companies whose business is being developed. Among these the Evans Motor Car Co. of Nashville, Tenn., has bought 108 acres of land, with the view of establishing an automobile factory on eight acres and dividing the remainder into building lots for development.

### TRACTORS IN FARMING.

#### Increasing Use of Power Machinery in Agricultural Operations.

Power farming is becoming a factor in the development of the new South. Illustrative of the growing population, the internal combustion engine and the increasing realization of the importance of power farming machinery to the Southern farmer was the departure on March 10 of a trainload of power farming machinery from the factories of the M. Rumely Company, La Porte, Ind., to be distributed throughout the South. This shipment consisted of gasoline, kerosene and steam tractors, engine gang plows, feed grinders, oil tank wagons, baling presses and other machines. The route of this trainload was south from Chicago through Cairo, Ill. and Memphis, Tenn., to Jackson, Miss. A number of carloads were taken from this train at this point to be shipped



into Louisiana. The trainload then proceeded to Montgomery, Ala., Atlanta, Ga., and then to Charlotte, N. C., which ended the trip. At the various points along the route carloads of machinery were left to be distributed to Southern farmers.

This might really be called a real power farming invasion. This machinery will lighten the burdens of the farmer and replace the tired mule and horse for the drudgery of farm work. They will furnish its owner cheaper power to carry on his work, and will place in his hands the means of doing a larger volume of work and increasing the yields at a decreased cost.

One of the principal aims of the Southern farmer, as well as every other farmer in the United States, is to increase yields and at the same time decrease the cost of production. This insures larger and more substantial profits from the labor output.

This is only the beginning of the agricultural revolution which is bound to go on in the South. Each year there will be a continually increasing number of labor-saving machines and tractors that will go to developing the new South. The demand for power farming machinery is increasing very rapidly.

There are many cut-over timber lands which are very valuable, but which must be cleared and improved before they will produce crops. The farm tractor has been found very useful for this purpose, and pulling stumps and clearing land can be done very cheaply by this kind of power. Among the many other uses to which the engine is adapted are plowing, discing and harrowing, seeding, harvesting, threshing, road building, running cotton gins, feed grinders, pumping and many others.

It has been demonstrated that proper tillage is fundamental to increase yields, but at the same time we know that machinery and power are also necessary for proper tillage. It is this fact which the Southern farmer is realizing, and the reason for the big shipments of power farming machinery into his part of the country.

Aside from the tillage problem, the unreliability of labor is solved very largely by means of the tractor. An engine takes the place of a large number of horses, which need also a large number of men to handle them. An engine capable of replacing 15 horses can be handled by one man, who does the work of three to five men which are needed to handle the horses.

The time has come when the Southern farmer is alive to his opportunities, and the fact that he is employing better methods of agriculture, more machinery and mechanical power is evidence enough of the rapid progress which he is bound to make in the next few years.

#### To Manufacture Patent Harrow.

[Special Dispatch to Manufacturers Record.]  
Tifton, Ga., March 24.

Contracts were closed today between John H. Brown of Scott county, Mo., inventor and owner of a patent harrow, and the Tifton Foundry & Machine Co., by which the latter contracts for the exclusive manufacture of the harrow for the Southern territory. The contract provides for the manufacture of a minimum of 50,000 harrows per annum and will necessitate the addition of about \$10,000 worth of machinery to the company's plant, the expenditure of about \$20,000 for material, the construction of additional buildings, an addition of 25 or 30 men to the present force, and a capital stock increase from \$25,000 to \$50,000. The size and character of the new building will be determined in a few days. Contracts for the machinery are now being placed.

J. L. HERING.

## RAILROADS

[A complete record of all new railroad building in the South will be found in the Construction Department.]

### LARGE MARYLAND MERGER.

Stockholders Approve the Hagerstown and Frederick Public Utilities Combine.

The formal accomplishment of the merger of electric railways and other public utilities at Frederick, Hagerstown, Middletown, Boonsboro and other points in Frederick and Washington counties, Maryland, has just been attained by the votes of the stockholders of the several companies concerned. There are now about 50 miles of railroad track in the consolidation, connecting the different points mentioned, besides others, as well as gas and electric-light and power plants. The new combine is known as the Hagerstown & Frederick Railroad Co., and its officers are: President, Emory L. Coblenz of Frederick; vice-presidents, Frederick C. Todd of Baltimore county and Henry Holzapfel of Hagerstown; treasurer, Thomas H. Haller of Frederick, Md.; assistant treasurer, William J. Harvie of Montclair, N. J.; secretary, V. M. Cushwa of Hagerstown; assistant secretary, Mr. Harvie. There is a large board of directors, and, in addition to residents of the several places connected by the railways, there are the following: Harry E. Clark of Philadelphia, Pa.; J. J. Shannahan of Newport News, Va.; Wm. L. Taber of Utica, N. Y.; Henry A. Abbe of New Britain, Conn.; Talmadge C. Cherry of Annapolis, Md.; Clifford A. Hoog and Ernest J. Edgecombe of Syracuse, N. Y.; James Piper of Baltimore county, Maryland; Edwin W. Poe and Francis K. Carey of Baltimore city.

It is understood that President Coblenz will not consent to retain the presidency of the new company for a great length of time, but that he agreed to take the chair only until such time as Edward F. Peck of Syracuse could take over the duties of president. The latter is of the firm of Allen & Peck of Syracuse, who are understood to have participated in financing necessary to fulfilling the merger.

The properties combined are the following: Frederick Railroad, Frederick Gas & Electric, Hagerstown Railway, Myersville & Catoctin Railroad, Hagerstown & Northern Railroad, Hagerstown & Boonsboro Railroad and the Frederick & Hagerstown Power Co. The capitalization is \$2,000,000 of common and \$1,000,000 of preferred stock, of which latter there has been issued \$635,000. There are also \$3,000,000 of bonds, out of a total authorized issue of \$10,000,000.

It is further stated that the merger will require the raising of about \$1,250,000 in cash at present to liquidate the floating debt and provide for extensions, improvements and betterments. A number of new cars are to be ordered. The permanent way will also be improved, both as to track and roadbed, and the new power plant at Security, Md., will be connected up to furnish current to various points as well as to Hagerstown and Frederick. For about a year this merger has been the aim of Messrs. Coblenz, Todd and Piper of the board of directors.

Allen & Peck are public utility engineers, who are already operating properties in Newport News and Hampton, Va., and the Baltimore & Annapolis Short Line Electric Railway. A New York syndicate has underwritten \$1,500,000 of first mortgage and refunding notes, which are designed to yield the cash required. There will be about \$650,000 for equipment and improvements, etc. When

Mr. Peck assumes the presidency he will reside at Hagerstown. W. J. Harvie will be manager.

### CAPE LOOKOUT TERMINAL.

Further Particulars About Railroad and Government Work Planned.

Charter has just been granted in North Carolina to the Beaufort Terminal Railway Co. for the construction of its proposed railroad and seacoast terminals. It will build a railroad, which will be an extension of the Norfolk Southern Railroad from Beaufort to Cape Lookout, N. C., about 12 miles, and also construct at the latter point docks, piers, etc., for a first-class tidewater terminal. E. C. Duncan of Raleigh, N. C.; W. B. Rodman and M. S. Hawkins of Norfolk, Va., are the incorporators, all of whom are connected with the Norfolk Southern Railroad Co., Mr. Duncan as a director, Mr. Rodman as general solicitor and Mr. Hawkins as assistant to the president and secretary.

The capitalization of the new company is \$5,000,000, and it is said that the construction it proposes is to be of the most substantial character, of stone, etc. The Government is to construct a large breakwater and establish a harbor of refuge.

It is noteworthy that this enterprise will establish an important railroad terminal at a point south of Cape Hatteras; in fact, the first point available that is convenient to the ocean. It is estimated that the breakwater will cost the Government \$5,000,000, and of this sum \$1,400,000 is said to be already authorized. The railroad company is to operate stone quarries which are adjacent to its line to provide the material for the improvements at Cape Lookout. The terminal company is to issue bonds. It is expected that the Norfolk Southern will from its quarries furnish the stone necessary for the Government breakwater. Cape Lookout is said to be especially desirable for a railroad terminus, as it is the furthest east south of Hatteras, and therefore particularly advantageous to coal vessels going to and from the Panama Canal.

The Norfolk Southern is expected to have its western extension to Charlotte, N. C., completed and in operation by the summer. It has yet to announce in detail its plans for the Beaufort Terminal Co.

In connection with the extensive work proposed by the railroad company at Cape Lookout, it is interesting to note the organization of the Cape Lookout Land & Improvement Co., Inc., with main office in the American National Bank Building at Richmond, Va.; capital \$200,000. E. H. Howe is president; Chas. P. Pearson, vice-president, and C. K. Howe, secretary and treasurer. About 600 acres of land at Cape Lookout are to be developed, and a resort is to be established. A hotel and cottages are to be erected. Chas. K. Howe, Beaufort, N. C., is engineer in charge.

### EXTENSIVE TERMINAL WORK.

Pennsylvania Railroad Proposes to Spend Large Sum in Heart of Baltimore.

Concerning the contemplated improvement of the freight facilities of the Pennsylvania Railroad in the heart of Baltimore, which were mentioned in a general way in the MANUFACTURERS RECORD of March 6, President Samuel Rea of the Pennsylvania has written to Mayor James H. Preston of Baltimore suggesting a conference with him and other city officers, and including other officials of the railroad, to discuss the construction which the company has in mind in order to reach a definite conclusion as to what can be

done to relieve the congestion now existing and increasing around Calvert Station. The work as outlined would include a rearrangement of freight tracks, the closing of some and the elevation of other east and west streets which now cross the tracks of the railroad at grade; also the erection of warehouses, freight platforms, etc. If the public will consent to it, passenger service in and out of Calvert Station will be discontinued, as the running of passenger trains there, it is said, interferes considerably with the expeditious handling of freight business in that vicinity. At present the railroad is required by law to run passenger trains to that point.

The proposition advanced several years ago to build a belt line railroad around Baltimore in order to lessen the number of trains using the tracks through Union Station, about a mile north of Calvert Station, is not included in the present ideas of the railroad company; neither is there any intention to build a passenger station farther down town than Calvert Station, as the attitude of the company is that Union Station is adequate for its passenger service to and from the business district. The company does not state the probable cost of the improvements which it proposes to make, but it will necessarily be very large. Mayor Preston has consented to the proposition to hold a conference, and it will doubtless be held soon.

### FREEMONT A BIG TERMINAL.

Houston & Brazos Valley Line Reported Bought by "Katy" System.

A special dispatch from Houston, Tex., to the MANUFACTURERS RECORD says that an apparently authentic report is circulated there to the effect that the Missouri, Kansas & Texas Railway Co. has purchased the Houston & Brazos Valley Railway with the intention of making Freeport the southern terminus of the entire system and constructing terminal facilities there.

The Houston & Brazos Valley line is now operating 60 miles of track from Houston to Velasco, Tex., and its published maps show that to reach Freeport by an extension of about three miles is its intention. Felix Jackson of Velasco, Tex., is president; E. P. Swenson, 37 Wall street, New York, vice-president. The Seaboard & Gulf Steamship Co., an affiliated concern, operates steamers from New York to Velasco. Ed. S. Hughes, Abilene, Tex., is president of the steamship company.

### New Equipment, Rails, Etc.

San Antonio & Aransas Pass Railway has ordered 450 tons of structural steel from the Virginia Bridge & Iron Works, Roanoke, Va.

Atlantic Coast Line, says a report from Raleigh, N. C., has ordered equipment as follows: 25 10-wheel freight engines with superheaters, 12 steel passenger cars and 8 steel combination cars 70 feet long; also for passenger service: 1000 ventilated box cars, 300 flat cars and 50 ballast cars.

Baltimore & Ohio, says a market report, has ordered 20 additional locomotives, 12 from the American Locomotive Co. and 8 from the Baldwin works.

San Antonio Traction Co. has ordered 15 double-truck pay-as-you-enter cars from the American Car Co., St. Louis.

Pennsylvania Lines West have ordered 42 passenger cars, 31 combination passenger and baggage cars, 5 baggage cars, 5 dining cars and 2 mail cars, the contracts being distributed to the American Car & Foundry Co., the Pressed Steel Car Co. and the Standard Steel Car Co.

Moss Point & Pascagoula Northern

Railroad, it is reported, will purchase two electric storage battery motor cars.

Chicago & Alton Railroad, says a market report, has ordered 7000 tons of rails from the United States Steel Corporation.

Tidewater Power Co., Wilmington, N. C., says a report from there, is building in its shops three passenger cars 50 feet long for the line to Wrightsville Beach.

Texas & Pacific Railway is reported to have ordered 15,000 tons of rails from the United States Steel Corporation.

Southern Railway, according to a market report, may purchase soon from 3000 to 5000 cars.

L. E. Martin, Bowling Green, Va., who, with others, contemplate building a line from Bowling Green to Milford, Va., is inquiring concerning electric storage battery cars.

Asheville Electric Co., Asheville, N. C., has ordered from the J. G. Brill Company, Philadelphia, six semi-convertible cars 21 feet long.

Hagerstown & Frederick Railroad Co., Frederick, Md., E. L. Coblenz, president, will purchase a number of new cars.

### Birmingham-Tuscaloosa Railway.

Additional particulars of the plans of Morris Bros., bankers, 1421 Chestnut street, Philadelphia, in connection with the construction of an electric railway from Birmingham to Tuscaloosa, Ala., are contained in a report from there quoting Fred S. Morris as saying that a contract has been awarded to the General Electric Co. to build a new power plant at Tuscaloosa for \$140,000, and it will be constructed in such a manner that as many more units as may be necessary at any time can be added when required; also that there is no design on the part of the company at this time to build a line to connect Gadsden with Birmingham, although some day that might be considered.

The railroad to Tuscaloosa will be 45 miles long, and a large steam shovel and a number of dump cars of the latest pattern are there ready to begin construction. The road will be double-tracked, and will be ready for operation by July 1 of next year. Perhaps \$5,000,000 will be expended for the railroad and other public service utilities in which Morris Bros. are interested at and near the two cities which are to be connected.

### Baltimore & Ohio Earnings.

The Baltimore & Ohio Railroad Co.'s statement covering its earnings and expenses for February shows that the operating revenue of \$7,362,870 was an increase of \$560,256 as compared with the same month of last year. Total operating expenses were \$5,760,466, or an increase of \$531,545, and the net operating revenue was \$1,602,404, an increase of \$28,711.

The company's figures for the eight months of the fiscal year from July 1 last to February 28 show operating revenues of \$68,216,212, increase \$7,921,062; total operating expenses \$48,489,566, increase \$5,929,961; net operating revenue \$19,726,646, increase \$1,991,131.

The statement does not include the outside operations of the company, which will show a deficit in net for February of \$74,468, as compared with a deficit of \$31,852 for February of 1912.

### Western Maryland's Warehouse.

The Western Maryland Railway has completed and put in operation its new warehouse adjoining Hillen Station, at the corner of High and Hillen streets, Baltimore. The building, which is a six-story structure of concrete and brick, is 250x60 feet, and is equipped with elevators and various other labor-saving devices. Thirty

cars can be unloaded simultaneously at the warehouse. This addition to the Western Maryland's terminal facilities was erected by the Fidelity Warehouse Co., of which J. M. Fitzgerald is president, as well as president of the railroad. T. E. Witters is its general manager.

### Utilities Sold to Doherty & Co.

President R. H. Wright of the Durham Traction Co., Durham, N. C., is quoted in a report from there as announcing that control has been sold to Henry L. Doherty & Co., 60 Wall street, New York. The company controls the railway, electric light and ice business in Durham. The sale comprised stock held by Mr. Wright and J. S. Carr. The new owners are to take over the properties immediately, but R. L. Lindsey will continue as manager.

### Monongahela Valley Traction.

The total gross earnings of the Monongahela Valley Traction Co. for January and February of this year are published thus for comparison: 1913, \$134,383; 1912, \$114,825; operating expenses, 1913, \$46,624; 1912, \$47,997; net earnings, 1913, \$87,758; 1912, \$66,827; fixed charges, taxes and insurance, 1913, \$48,204; 1912, \$36,521; net surplus, 1913, \$39,553; 1912, \$30,306.

### Motor Buses for Washington.

The National Motor Transportation Co. is to operate a line of motor buses in street transportation at Washington, D. C., beginning May 1. It will operate from the northwestern part of the city to the Capitol and the Union Station via F street and Pennsylvania avenue. Horace H. Westcott is president and S. E. Lyon general manager of the company.

### Municipal Subway for St. Louis.

A report from Jefferson City, capital of Missouri, says that the Legislature has adopted a constitutional amendment to authorize St. Louis city to issue a loan of \$30,000,000 for the construction of a municipal subway, but the amendment must be ratified by the voters of the State at the fall election next year. Under it Kansas City may also vote subway bonds.

### Southern Railway Signal System.

President W. W. Finley of the Southern Railway Co. announces that construction will begin soon to install automatic electric block signals from the terminals at Alexandria, Va., to Orange, Va., 78 miles. This signal system will connect with the automatic block system of the Washington Terminal, so that there will be continuous electric block signals all the way from Washington to Orange.

### Leckie Collieries Co.

The Leckie Collieries Co., plant at Williamson and main office at Welch, W. Va., has organized with a capital stock of \$150,000 and the following officers: Vice-president, H. A. Miller of Cincinnati; president and manager, Wm. Leckie of Welch; secretary and treasurer, A. E. Jennings of Welch. This company will develop 1000 acres of coal land, and proposes a daily output of 1500 tons of coal, all equipment to be electrically driven and to include 200-kilowatt generator, modern tipples, shaking screens, picking tables, etc. Machinery bids are to be opened on April 1, and the company's construction engineer is J. Harvey Williams of Welch.

The annual report of the Baltimore county (Maryland) roads engineer shows that in the past calendar year \$362,204 were expended for labor and materials upon 1191.8 miles of roads in the county.

## TEXTILES

[A complete record of new textile enterprises in the South will be found in the Construction Department.]

Correspondence relating to textile matters, especially to the cotton-mill interests of the South, and items of news about new mills or enlargements, special contracts for goods, market conditions, etc., are invited by the MANUFACTURERS RECORD. We shall be glad to have such matters at all times, and also to have any general discussion relating to cotton matters.

### Caswell Cotton Mills.

The Caswell Cotton Mills, Kinston, N. C., writes to the MANUFACTURERS RECORD as follows:

"In reference to addition we propose to build, we now expect to erect a 100-foot extension to our old building, two stories, which will take care of about 14,000 spindles. Our present equipment is 5400 spindles, and we have already placed an order for 5400 spindles with the Howard & Bullough American Machine Co. of Pawtucket. This machinery is to be delivered during the summer, and we expect to have the plant completed and the machinery installed by August next. Most of our building materials have been purchased. We have ample power at present to operate the additional machinery.

### Erlanger Cotton Mills.

The Erlanger Cotton Mills, Lexington, N. C., has awarded contract to the Galivan Building Co., Greenville, S. C., to erect its buildings. These include the main structure, 638x132 feet, of brick, with concrete floors, costing about \$125,000, and tenements costing about \$50,000. The machinery will include 25,000 spindles, 680 looms, etc., driven by electric and steam power, for manufacturing cloth for men's underwear made by Erlanger Bros. of New York, who, with George W. Montcastle of Lexington, organized the company. J. E. Serrine is the architect-engineer in charge. The Erlanger company will organize with a capital of probably \$500,000.

### To Enlarge Cotton Mill.

The Monarch Cotton Mills, Union, S. C., will build an additional mill, and wires brief details to the MANUFACTURERS RECORD as follows:

"Mill building 380x125 feet, four stories and basement, of mill construction; 20,000 spindles and 500 looms decided upon; 55 tenements and one warehouse."

An unofficial report states that the company has awarded the building contract to T. C. Thompson & Bros. of Birmingham and Charlotte, and that the new structures and their machinery will cost \$500,000.

### Prendergast Cotton Mills.

The Prendergast (Tenn.) Cotton Mills is now manufacturing single and ply knitting and weaving yarns. The company has a 200x160-foot one-story-and-basement building, containing 10,000 producing and 2000 twister spindles, for a monthly capacity of about 100,000 pounds of yarns, and 175 operatives are employed. Electric power is used. The plant cost about \$130,000. This company's organization and detailed plans were previously announced.

### Crystal Springs Mill.

The Crystal Springs Bleachery Co., Chickamauga, Ga., will issue bonds for \$400,000 and increase capital stock to \$1,000,000. It writes to the MANUFACTURERS RECORD: "Our new building will be 375x131 feet, three stories, of brick

construction, with concrete foundation; will install 20,000 spindles and 700 looms." This company was previously referred to as planning to build a mill.

### Textile Notes.

The Vance Cotton Mills, Salisbury, N. C., will install additional twistors.

The Ozark Mills, Gastonia, N. C., now operating 10,724 spindles, is reported as to double capacity.

J. C. Beesley, Murfreesboro, Tenn., is interested in a plan to form a company for building a cotton mill to be driven by electrical power.

W. P. Leister, lately mentioned as interested in a plan to establish a knitting mill at Forest City, N. C., advises (from Shelby, N. C.) that there is nothing definite in this report at present.

Goodin, Reid & Co., Cincinnati, O., are reported to have purchased the Selma (Ala.) Cotton Mills for \$125,000 and as to invest \$75,000 for improvements. The plant has 18,000 spindles, 340 looms and other equipment.

The Dunn Manufacturing Co., Gastonia, N. C., will add 1000 spindles, four carders and two speeders, having awarded the contract for this machinery. It has erected a 75x44-foot addition to accommodate the new machinery.

The Clara Manufacturing Co., Gastonia, N. C., will soon complete its 160x75-foot additional building and install 4000 spindles, with accompanying machinery. This enlargement was announced in January as to include 3700 additional spindles.

## LUMBER

[A complete record of new mills and building operations in the South will be found in the Construction Department.]

### Wants Pulp and Paper Factory.

Editor Manufacturers Record:

Chamber of Commerce,

Gadsden, Ala., March 21.

Gadsden offers a great opportunity to a pulp and paper factory. The refuse from our cooperage plants, sawmills, heading plants, woodworking plants and forests, which are now being burnt or otherwise thrown away, could be utilized in a pulp and paper factory. Especially would this kind of factory prove most profitable here on account of our excellent shipping facilities and cheap hydro-electric power, having five trunk line railroads and the Coosa River.

C. W. ROBERTS, Secretary.

### To Cut North Carolina Timber.

J. M. English, Robert Greenwood and T. E. Blackstone of Asheville have purchased 3000 acres of hardwood timber land, 2,500,000 feet of dry lumber, seven-foot band-saw mill, five-mile tram road, logging engine and other equipment in Graham county, North Carolina. They will at once arrange to manufacture lumber, from 30,000 to 40,000 feet daily, and will probably incorporate a company. The property was purchased from George H. Christian of Minneapolis, and it is reported that the price was about \$125,000.

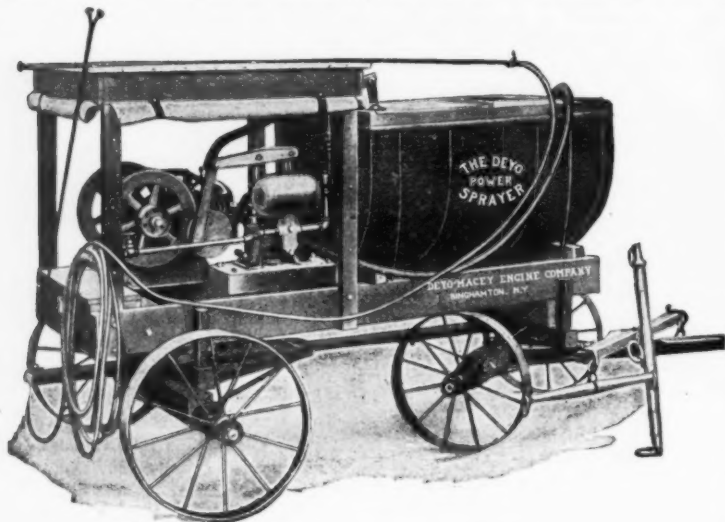
L. C. Bradley of Galveston, Tex., has, according to a report from there, been appointed assistant district manager for the Stone & Webster public utility properties in Texas, with headquarters at Dallas. He is now vice-president of the Houston Electric and the Galveston-Houston Electric Railway companies, besides being manager of the Galveston Electric Co.



## MECHANICAL

### The Deyo Power Sprayer.

The increasing knowledge and appreciation of the advantages of spraying vineyards, trees and garden plants to prevent growth of deleterious organisms and to exterminate insects has produced a demand for power sprayers by means of



GASOLINE PUMP POWER SPRAYER.

which large areas may be cared for in an effective and quick way.

The Deyo-Macey Engine Co., Binghamton, N. Y., manufactures the power sprayer shown in the accompanying illustration. This sprayer has a capacity for a large quantity of the spraying mixture in the tank shown, and, while being drawn by horses, the gasoline engine and pump supply the liquid through the hose and spray nozzles with sufficient force to reach the highest orchard trees and to cover a considerable area. Special sizes of sprayers are furnished to suit the conditions to be met, such as Elm tree sprayers, with capacity of 700 gallons per hour and 200 pounds pressure, and weight of outfit of 2200 pounds. Eight other standard outfits are made from this size down to weight of 650 pounds. The engines are manufactured by the Deyo company, especially adapted to this purpose, and the pumps are the Goulds standard Emperor pump manufactured by the Goulds Manufacturing Co., Seneca Falls, N. Y.

A catalogue on the Deyo power sprayer, containing information regarding the use of sprays, advantages, etc., may be obtained by addressing the company.

### New Paper Mill Engine.

Since the fundamental requirements of a variable speed paper mill engine are a speed range equivalent to the desired speed range of the rolls, and as nearly as possible perfect regulation at all speeds, the main point in engine design for wide speed range for paper mill drive is to arrange the cylinders of the engine and to design reciprocating parts and counterweights so that the reciprocating forces are neutralized and perfect balance is secured, thus permitting of running the engine at high speeds.

To meet these requirements the American Engine Co., Bound Brook, N. J., has developed the American-Ball four-cylinder paper mill engine, with four cylinders arranged in pairs at right angles. The engine is thus built of two units, each of which has a vertical and horizontal cylinder. Each pair of vertical and horizontal pistons drives a common crankpin, and there are eight power strokes per revolution, evenly distributed 45 degrees apart. A counter-

weight on each crank transfers the horizontal reciprocating forces from a horizontal to a vertical plane, in which they meet equal and opposite reciprocating forces from the vertical reciprocating masses, which therefore neutralize unbalancing. This permits of operation at high speeds, as is also the case with the widely used American-Ball angle compound engine. The balancing of this en-

gine is such that it may be operated at speeds of 400 to 500 R. P. M., and owing to the perfect balancing and even turning effort the engine may be operated at a lower speed of 50 R. P. M. with good regulation, so that a total speed range of 8 to 1 and even 10 to 1 may be obtained. The engine may be coupled directly to the line shafting.

The speed changing and governing mechanisms as used with American-Ball paper mill engines perform a number of important functions and form an important part of the engine equipment. Two governors are used. Each of these governors is of a standard type, specially improved and adapted to this particular service. The first governor is the automatic engine safety stop, and is placed nearest the steam supply pipe. It is driven by belt directly from the engine shaft, and is fitted with an automatic tripping mechanism. The steam valve remains wide open throughout the whole normal range of speeds for which the engine is designed, but in case the speed exceeds the predetermined limit the mechanism is tripped and the weighted lever closes the steam valve. At all normal speeds this governor valve has no throttling effect whatever, and hence cannot affect the engine speed. The second governor controls the engine speed, and is driven through the variable speed friction device.

The requirement of constant speed throughout a wide variation in speed, as for paper mill service, is a most difficult one to meet. When once the speed of the engine has been adjusted to give a certain grade of paper, the speed must stay constant, and must not be affected by variations in steam pressure or back pressure, which would cause surges in speed or breaking of the paper. To prevent such speed surges a standard governor has been equipped with a mechanism comprising stabilizing springs and an oil pot. The piston of the oil pot receives motion from the governor stem through the spring stabilizing device, which absorbs shocks induced by sudden changes in speed of the governor balls. This stabilized governor is driven from the engine through variable speed friction device specially designed by the American Engine Co. A belt from a pulley on the engine shaft

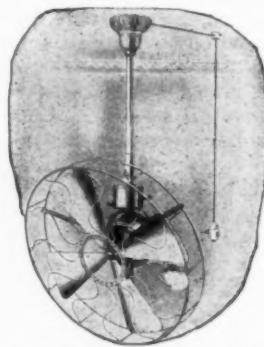
drives a pulley on the friction device, which drives a second pulley through two discs and two pairs of friction wheels. Any speed from minimum to maximum may be imparted to the second pulley, which, in turn, drives the governor. The two large iron wheels or discs are each keyed to a pulley shaft. Bearing on the surface of these discs are four small friction wheels, one on each side of each disc. The driving disc keyed to the shaft of the driving pulley rotates the two friction wheels held against it by springs, and the second pair of friction wheels drive the second disc and the pulley keyed to its shaft. The speed is changed by simply shifting the position of the friction wheels, which are carried by four rockers located in pairs, each pair being held to a shaft which passes through guides and may be shifted as desired by a chain wheel and lead screw cut at one end. Each pair of rockers is held together by springs, thus keeping the friction wheels firmly against the discs. All bearings are of the ball-bearing type.

### The Bates Electric "Rotofan."

An electric fan designed for efficient use as a ceiling fan has been brought out by the D. L. Bates & Bro. Co. of Dayton, O., and is known as the "Rotofan."

As shown in the accompanying illustration, the "Rotofan" is so constructed that it rotates about the vertical hanger from the ceiling in such a way that the air is driven at an angle downward and outward, thus being distributed equally in all directions. For this reason the fan does effective work in supplying the air circulation where needed at a minimum of expenditure of electric current and reducing interference of currents, which tends to neutralize the circulation.

The rotation about the hanging stem is produced by the reaction of the revolving fan. It is made for alternating or direct current. This type of fan is well



THE BATES ELECTRIC "ROTOFAN."

adapted for use in banks, stores, restaurants, factories, and all places where fans can be used.

The Bates company also manufactures electric, water and belt-driven fans for desk, ceiling and wall use. Its various fans are described and illustrated in the Bates fan book, which will be sent to interested persons on request.

### National Heater in Worsted Mills.

A hot-water heater 9 feet long by 5½ feet in diameter has been constructed recently by the National Pipe Bending Co., New Haven, Conn., for the Wood Worsted Mills at Lawrence, Mass. This heater is of the "U-bend" type, and has a capacity of 125,000 pounds of water per hour, heating it from 100 degrees to 212 degrees Fahr. by exhaust steam. It rests horizontally on cradles and contains 212 1¼-inch brass tubes expanded into a header.

The water enters at the front through an eight-inch inlet and flows through a

bank of tubes, passing longitudinally from front to rear, then to the front again, and again to the rear, making four passes before leaving through a water outlet of the same size at the front. The water is directed through the tubes by means of baffles on the header. These baffles divide the space horizontally into two main sections, and other baffles divide the upper section into three parts and the lower section into two parts.

The steam enters a 10-inch inlet at the top and entirely surrounds the tubes, the condensation leaving the heater by a four-inch drain at the bottom. All the tubes are brass, making the water from the condensed steam suitable for wool and worsted washing or boiler feed.

The heater may also be used by reversing the action, that is, by directing the steam through the tubes which are then surrounded with water. As a result the water, being greater in quantity, would be maintained at lower temperatures.

### Cotton Oil in Argentina.

J. A. Bourgeois of the Louisville (Ky.) Cotton Oil Co., writes to the MANUFACTURERS RECORD:

"In one of your recent issues you took notice of the proposed increase in import duties on American cotton oil in the Republic of Argentina. It may interest you to learn that our Buenos Aires friends advise us in this connection that, while the leaders of the socialist faction of the Argentine Chamber of Deputies proposed last September a reform of the present Argentine custom-house tariff, so as to reduce the tax of duty on a good many articles of prime necessity, and, in exchange, to increase same very considerably on all 'articles de luxe,' in order to try in this way to reduce the present high cost of living in that country, and while the socialist party suggested that the modified tariff should enter into force in May next, the general belief there is at present that the socialist leaders, having met with a very strong opposition in the Chamber of Deputies, there will be no change at all this year, and that the projected scheme will remain again on file, with so many new plans.

"The eventual increase of duty of two cents, gold, the kilo, equal to five cents paper money, the liter, will not affect at all the imports of cotton oils, as the difference is considered small and without any consequence by our principal buyers of oil in Argentina.

"We understand the Department of State in Washington has since been in receipt of a telegram from the American charge d'affaires at Buenos Aires, reporting that no action will be taken on the proposed tariff changes in regard to the duty on importations of cottonseed oil and olive oil by the present extraordinary session of Congress. The charge adds that Congress will adjourn at an early date."

### Natural Gas for Oklahoma City.

Chamber of Commerce,  
Oklahoma City, Okla., March 17.

Editor Manufacturers Record:

The Chamber of Commerce has inaugurated a movement looking to the building of an independent pipe line from the Cushing gas and oil field into Oklahoma City, thus providing natural gas at a rate of not to exceed six cents per thousand cubic feet for industrial purposes. Contracts with local users have already been entered into amounting to 15,000,000 cubic feet daily; leases on the gas lands have been secured and financial interests in the East have guaranteed the construction of the pipe line. W. B. MOORE, Secy.-Mgr.

# Construction Department

## TO OUR READERS!

In order to follow up properly the Construction Department items, please bear in mind the following statements:

### EXPLANATORY

The MANUFACTURERS RECORD seeks to verify the items reported in its Construction Department by full investigation. It is often impossible to do this before the item must be printed or else lose its value as news, and in some items it is found advisable to make statements as "it is reported" or "rumored," and not as positive information. If our readers will note these points they will see the necessity of the discrimination. We are always glad to have our attention called to errors that may occur.

### HOW TO ADDRESS

The name of one or more incorporators of a newly incorporated enterprise should always be shown on letter addressed to the official headquarters or to the town of the parties sought, as may be shown in the item. Sometimes a communication merely addressed in the corporate or official name of a newly established company or enterprise cannot be delivered by the postmaster. By following these general directions the postoffice will be enabled to deliver your mail promptly, although it is inevitable that some failure by the postal authorities to deliver mail to new concerns will occur.

### WRITE PERSONAL LETTERS

In communicating with individuals and firms reported in these columns a letter written specifically about the matter reported will receive better and quicker attention than a circular. In most instances a return postal card or addressed and stamped envelope should be enclosed with letter.

In correspondence relating to information published in this department, it will be of advantage to all concerned if the Manufacturers Record is mentioned.

The Daily Bulletin of the Manufacturers Record is published every business day in order to give the earliest possible news about new industrial, commercial, building, railroad and financial enterprises organized in the South and Southwest. It is invaluable to manufacturers, contractors, engineers and all others who want to get in touch at the earliest moment with new undertakings, or the enlargement of established enterprises. The subscription price is \$25 per year. On all advertising contracts in the Manufacturers Record for three months or longer a subscription to the Daily Bulletin is included for the contract period.

### BRIDGES, CULVERTS, VIADUCTS

Ala., Bay Minette.—Baldwin county will construct steel bridge at Aiken's Lake, on road from Bay Minette to Stockton; bids opened by Commissioners' Court April 8; received by John H. Taylor, Commissioner Second District, until April 5. (See "Machinery Wanted.")

Ark., Jasper.—Newton county will construct two steel bridges; estimated cost, \$25,000. County Commissioners will soon award contract.

Ark., Little Rock.—Board of Public Affairs awarded contract to Nick Peay of Little Rock at \$2177 to construct culvert on Commerce St., in East Second Street Paving District.

Ga., Newnan.—C. K. Lawrence, chief engineer Central of Georgia Railway, Savannah, Ga., states that recently-noted Lagrange St. viaduct will be built by his company and city of Newnan; cost \$10,000; date of opening bids not fixed; one-span truss, 119 feet; concrete and wood approaches 534 feet.

Ky., Louisville.—Louisville & Nashville Railroad, W. H. Courtenay, chief engineer, will construct steel and concrete viaduct across Second Creek; 420 to 440 feet long; cost \$60,000; contract awarded.

Okla., McAlester.—Pittsburg county will construct three bridges, over North Boggy, Coal and Long Town creeks; considering several kinds of construction; bids received April 19 and opened April 21; P. S. Lester, chairman of Board of Commissioners; W. S.

O'Neal, County Clerk. (See "Machinery Wanted.")

S. C., Cheraw.—G. A. Sherrill will construct steel bridge about 125 feet long; desires architects and contractors to submit plans and estimates. (See "Machinery Wanted.")

Tenn., Lebanon.—Wilson County Bridge Commission, J. N. Adams, chairman, will construct two bridges, one at Lebanon, 70 feet long and 60 feet wide, of concrete; other at Liberty, 225 feet long, of steel; cost \$2500 and \$2000, respectively; Professor Drane of Lebanon, engineer in charge; bids opened April 7. (See "Machinery Wanted.")

Tenn., Liberty.—Wilson County Bridge Commission, J. N. Adams, chairman, will construct 225-foot steel bridge; cost \$2000. (See Tenn., Lebanon, and "Machinery Wanted.")

Tex., Christine.—Artesian Belt Railroad Co., John P. Jackson, chief engineer, Macedonia, Tex., will construct 10 trestles, aggregating in length 600 feet.

Tex., Fort Worth.—Tarrant County Commissioners finally approved specifications and form of contracts for East 4th St. and Samuel Ave. bridges; total cost estimated at \$120,000; County Auditor will soon invite bids. (Previously mentioned.)

### CANNING AND PACKING PLANTS

Ark., Olney.—Charles Trease will build cannery.

Ga., Adel.—Southern Food Products Co. organized for operating canning factories in South Georgia and Alabama; Adel plant in operation; four others under construction; capital stock \$100,000; product, tomatoes, beans, beets, sweet potatoes and syrup; all proposals for machinery and equipment may be addressed to E. M. Benson, president. (See "Machinery Wanted.")

## PROPOSAL ADVERTISEMENTS

IN THIS ISSUE ARE

PUBLISHED ON PAGES 82 and 83

In order to secure best bids from leading engineers, contractors and investment houses, the proposal advertising columns of the Manufacturers Record are invaluable.

Rate 20 cents per line per issue.

When Proposal Advertisements cannot be sent by mail in time to secure insertion before date for opening bids, please wire advertisement copy collect by Night Letter.

Proposal Advertising forms close Wednesday, 10 A. M.

N. C., Pineview.—Never-Fail Farm, George T. Kearsley, secretary, awarded contract to erect 26 barns and packing-houses. (See "Machinery Wanted.")

W. Va., Nicolette.—Nicolette Canning Co. (recently noted to plant and contract for tomatoes, etc.) will open proposals April 1 for erection of 100x200-foot building; will incorporate to conduct tomato cannery.

W. Va., Wellburg.—West Packing Co. (previously noted incorporated, \$105,000 capital stock, by Geo. N. West, manager, and others) states may (later) make additions to present plant.

### CLAYWORKING PLANTS

Ark., Malvern.—Bricks.—Clark Pressed Brick Co., Malvern and 1907 Southern Trust Bldg., Little Rock, Ark., is proceeding with proposed improvements, including installation of producer gas fired kiln, plans and material for which have been purchased; manufacture common bricks and pressed fire-bricks.

D. C., Washington.—Maryland Slate, Brick & Tile Co. incorporated with \$100,000 capital stock by William H. Fisher (817 N. Carolina Ave. S. E.), Henry M. Conger and Albert W. Felka.

Tenn., Lewisburg.—Bricks.—S. M. Brogan purchased brick plant; will install machinery.

### COAL MINES AND COKE OVENS

Ala., West Blockton.—Cahaba Central Coal Co. (recently noted incorporated, capital stock \$20,000) will develop 100 acres; daily capacity 300 tons; no coke ovens; W. B. Young, president; Geo. W. Randall, secretary-treasurer; J. L. Parry, construction engineer. (See "Machinery Wanted.")

Ky., Aberdeen.—Butler County Coal Co., capital stock \$2000, incorporated by J. A. Watkins, C. M. Sullivan, J. C. Haney and C. L. Drury.

Ky., Waverly.—Hobson Coal Co., incorporated by A. Mahen Hobson, Sadie Delaney and W. R. Carter.

Ky., Harlan.—Martin's Fork Coal Mining Co., capital stock \$30,000, incorporated by W. F. A. Gregory, W. A. Brock, George W. Grech and H. M. Brock.

Tenn., Klondike.—J. M. Robinette will develop 200 acres of coal property; daily output not determined. (Recently noted.)

Tex., Bremond.—Bremond Southeastern Coal Co. organized to develop coal mines.

Va., Richmond.—Corona Coal & Coke Co., capital stock \$50,000, incorporated; Peter T. Murphy, president; A. T. Massey, vice-president; M. A. Powers, secretary-treasurer.

West Virginia.—Pocahontas Coal & Timber Co., capital stock \$500,000, incorporated by R. Boyd Cooling, Clarence J. Jacobs and Harry W. Davis, all of Wilmington, Del. Address company, care of Delaware Trust Co., Wilmington, Del.

W. Va., Fairmont.—Hutchins Coal Co. will erect boiler and engine-house; one story; brick and stone; cost \$4000; plans by R. A. Gillis, Jacobs Bldg., Fairmont; architect ready for bids.

W. Va., Seng.—Opperman Coal Co., capital stock \$50,000, incorporated by Thomas Richards, C. Riggs, A. C. Orcutt and others.

W. Va., Williamson.—Lackie Collieries Co., main office, Welch, W. Va. (recently noted incorporated under Ky., Pike County, with \$150,000 capital stock), advises will develop 1600 acres; open bids April 1 on machinery for estimated production of 1500 tons daily; Wm. Lackie, president and manager; W. A. Miller (Cincinnati, O.), vice-president; A. E.

\$2500; machinery will include lifters, rollers, separating machinery, shafting, pulleys, conveying machinery, etc. (See "Machinery Wanted.")

### DRAINAGE AND IRRIGATION

Ark., Lake Village.—J. B. Johnson, secretary, advises that upon revocation by State Legislature of act creating Chicot Drainage District, proposed drainage work has been abandoned; creative act allowed but \$300,000 bond issue, while completed survey by engineers showed estimated cost of \$639,000.

Ark., Pocahontas.—Running Lake Drainage District Commissioners will arrange for construction of proposed drainage canals; sold \$85,000 of bonds.

La., Monroe.—Executive committee to devise ways and means for drainage of La. Fourche Basin held organization meeting; elected following: President, W. T. Couper, Doss, La.; first vice-president, Wiley Roberts, Girard, La.; second vice-president, N. M. Davis, Columbia, La.; secretary, G. A. Petrie, Monroe; treasurer, H. D. Appar, Monroe; attorneys, Sander & Clark, Monroe; engineer, R. L. Morris, Jr., Monroe; Victor C. Barringer is chairman of executive committee, which took under preliminary consideration drainage of 428,000 acres by main canal and laterals, as follows: South of V., S. & P. R. R., in Ouachita parish, 66,000 acres; Caldwell parish, 40,000; Richland parish, 55,000; total, 161,000 acres; north of V., S. & P. R. R., Ouachita parish, 26,000 acres; Richland parish, 21,000; Morehouse parish, 155,000; Morehouse, east of Bonne Idee, 65,000 acres; total, 267,000; grand total, 428,000 acres.

Miss., Marks.—Dr. H. W. Crenshaw, Crenshaw, Miss., Commissioner Yazoo-Coldwater Drainage District, states at least eight months will be required to perfect plans for previously-noted drainage system, including diversion of river into Horn Lake, construction of 15-mile canal, etc.; will lay plans upon topographic survey made three or four years ago by U. S. Geological Department.

Okla., Hobart.—Rainey Mountain Irrigation Co., capital stock \$10,000, incorporated by H. A. Jones, B. G. Jones and George L. Zink.

### ELECTRIC PLANTS

Ala., Girard.—City is considering construction of electric-light plant and water-works; proposes \$45,000 bond issue. Address The Mayor.

Ala., Roanoke.—City votes May 1 on \$20,000 bond issue to improve and enlarge electric-light plant; W. H. Mann, Mayor.

Ark., Harrison.—Harrison Electric & Ice Co. issued \$25,000 additional preferred stock and will install equipment, including 5000-light dynamo.

Ala., Tuscaloosa.—Birmingham-Tuscaloosa Railway & Utilities Co. awarded contract to General Electric Co., Schenectady, N. Y., to construct electric plant, and wires Manufacturers Record brief description as follows: "80x120-foot building; brick and steel construction; 2000 kilowatts; cost \$140,000." (Recently reported incorporated under "Gas and Oil Enterprises.")

Fla., Pensacola.—Pensacola Electric Light Co. contemplates improving power plant and street railway system, including generators, car barns, etc.

Ga., Austell.—City contracted with J. B. McCrary Company of Atlanta, Ga., to furnish electric light and power.

Ga., Guyton.—City votes April 15 on \$5000 bond issue for electric-light plant. Address The Mayor.

Ky., Corydon.—City will expend \$12,000 to construct electric-light plant; develop 150 horse-power; erect 75x100-foot brick building; contract recently noted awarded to A. L. Swanson Company, Evansville, Ind.

Ky., Paducah.—Kentucky Southwestern Electric Railway, Light & Power Co., F. M. Smith, general manager, City National Bank Bldg., plans to erect power-house and two substations; cost \$158,450; date of opening bids not announced; W. A. Calhoun, consulting engineer, Paducah; recently noted. (See "Machinery Wanted.")

Ky., Whitesburg.—Wesley Wright (of Wright & Chase) will install electric-light plant.

Ky., Williamstown.—Williamstown Mill & Light Co. incorporated by J. M. Riley and others. (See "Flour, Feed and Meal Mills.")

### CONCRETE AND CEMENT PLANTS

Fla., Tampa.—Building Material.—Coquina Concrete Co. organized to manufacture building material.

Mo., Kansas City.—Cement Products.—Missouri Staple Cement Products Co., capital stock \$12,000, incorporated by D. F. McCarty, R. H. DeWeese and Herschel Mastin.

N. C., Salisbury.—Concrete Blocks.—C. A. Kriebbaum of Chambersburg, Pa., will establish plant to manufacture concrete blocks; machinery to be operated by electricity. (Recently mentioned.)

Okla., Oklahoma City.—Silos.—J. W. Maney and E. H. Lizee will organize company to manufacture reinforced concrete silos.

### COTTON COMPRESSES AND GINS

Ala., Demopolis.—Alabama Lumber & Supply Co. will erect cotton gin.

Okla., Mannford.—Farmers & Merchants' Gin Co., capital stock \$8000, incorporated by W. E. Gado, P. V. Clifford, J. A. Clugg and others.

Tenn., Jackson.—Union Gin Co., capital stock \$25,000, incorporated by M. W. Ewell, H. M. Trice, T. H. Hartman and others.

Tex., Anderson.—Anderson Gin & Water Co., capital stock \$10,000, incorporated by Reid Rickard, W. S. Brown and R. B. Mallard.

### COTTONSEED-OIL MILLS

S. C., Due West.—Due West Oil Mill will rebuild plant recently reported burned; cost



Ky., Winchester.—Clark County Fiscal Court granted franchise to Kentucky Utilities Co., Harry Reid, general manager, Lexington, Ky., for power and trolley lines in Clark county; build line to Mt. Sterling and other points; expend about \$50,000 in improvements to plant at Winchester, so as to enlarge capacity sufficiently to supply several smaller towns in Clark, Montgomery, Bourbon, Powell and Bath counties. (County recently reported to grant franchise.)

Ky., Seabree.—Seabree Light & Milling Co., capital stock \$20,000, incorporated by John B. Ramsey, J. J. Korb and M. J. Ramsey.

La., Lafayette.—City receives bids until April 9 for supplying and erecting machinery and equipment for recently-noted improvements to electric-light plant and water-works; Harold Raymond, engineer, New Orleans, La.; A. R. Trahan, Mayor. (See "Machinery Wanted.")

La., Shreveport.—Shreveport division of Southwestern Gas & Electric Co. (successor to Shreveport Gas, Electric Light & Power Co.), A. G. Curtis, general manager, will repair recently-noted damage to power plant; construction commenced.

Md., Baltimore.—Consolidated Gas, Electric Light & Power Co., Lexington and Liberty Sts., arranged to purchase (subject to approval by Public Service Commission) Patapsco Electric & Manufacturing Co. properties, including hydro-electric plant on Patapsco River near Relay, transmission system to Catonsville, and in Baltimore and Howard counties, etc.; proposed purchase price, \$425,000.

Md., Hagerstown.—Hagerstown & Frederick Railway Co. will have \$1,250,000 available for paying floating debt, extensions, betterments and improvements; will invest considerable amount for connecting Security (Md.) electric plant with consumers of electricity in Frederick and Hagerstown and other cities in Frederick and Washington counties; engineers in charge of improvements, Allen & Peck of Syracuse, N. Y.; reports state \$650,000 will be amount available for improvements referred to; Edward F. Peck will be president and located at Hagerstown.

Miss., Hattiesburg.—Doherty Operating Co. of New York, 60 Wall St., C. Z. Stevens, local manager, plans various improvements to system in Hattiesburg; install 1800-horsepower turbine with condenser and cooling tower, additional switchboard facilities, additional power and feeder line, 200-kilowatt railway generator, office building, extend car barns to include woodworking and blacksmith shops, etc.

Mo., Springfield.—City Council granted franchise to J. H. Rathbone, M. C. Baker and Roy Cox to construct electric-light plant; election for ratifying franchise will be held April 1.

N. C., Wilmington.—Tidewater Power Co. (recently noted to make some improvements at Winter Park and Wrightsville Beach) states has let contracts for all construction work of 1913.

Okla., Bristow.—City voted \$25,000 bond issue to build electric-light plant. Address The Mayor.

Okla., Calvin.—Calvin Light & Fuel Co., capital stock \$4000, incorporated by J. W. Hundley, W. T. Anglin and Owen M. Murray of Calvin and Fred D. Oiler of Tulsa, Okla.

S. C., Camden.—City voted \$125,000 bond issue to construct electric-light plant and water-works. Address The Mayor. (See "Water-works.")

S. C., Orangeburg.—City will vote on \$60,000 bond issue to remove and erect light, power and water plant on municipal property adjacent to Edisto River. Address The Mayor.

Tenn., Dresden.—City votes April 24 on \$12,000 bond issue to construct electric-light system. Address The Mayor. (This supersedes recently-noted election.)

Tenn., Gleason.—City contemplates constructing electric-light plant. Address The Mayor.

Tex., Fort Worth.—Eugene Ashe Electric Co., capital stock \$7000, incorporated by Eugene Ashe, H. S. Ashley and C. L. Clements.

Tex., Kyle.—City Council granted 50-year franchise to J. W. Tompkins and associates for electric-light plant.

Tex., Marshall.—Marshall Electric Co., capital stock \$300,000, incorporated by E. S. Fry, M. Turner and E. L. Wells, Jr.

Tex., Orange.—Luther Memorial Church will erect addition, 47 feet square, of reinforced concrete, for power plant; equipment to include 180-horse-power crude oil burning

engine. Address The Pastor, Luther Memorial Church.

Tex., San Antonio.—San Antonio Gas & Electric Co. and San Antonio Traction Co., E. Eysenbach, manager, announced budget for 1913, including \$300,000 appropriation, of which about \$50,000 will be for improvement of electric-light system, \$50,000 for extension of gas mains and \$100,000 for street paving and double tracking; improvements proposed to gas distributing system will include construction of belt line or transmission system from plant near International & Great Northern Railroad depot to Government Hill, and extension of smaller mains.

Va., Eastville.—Stanley Scott is interested in construction of electric-light plant.

W. Va., Anawalt.—Jeanette Light & Water Co., capital stock \$10,000, incorporated by R. L. Johnson, A. C. Davis, J. J. Stuart and others.

W. Va., Charleston.—West Virginia Light & Traction Co., capital stock \$50,000, incorporated by Angus W. McDonald, O. P. Fitzgerald, V. L. Black and others.

W. Va., Clarksburg.—Richards Construction Co. will erect two-story cement power-house and office building for Owens Eastern Bottle Co.; cost \$50,000.

W. Va., Wheeling.—Wheeling Valley Light & Power Co., capital stock \$50,000, incorporated by John W. Adams, M. S. Adams, Harry L. Bond and E. L. Bond.

W. Va., Logan.—Logan Electric Co. will, it is reported, build additional electric plant.

### FERTILIZER FACTORIES

Tenn., Franklin.—Franklin Fertilizer Co., capital stock \$10,000, incorporated by J. E. Rhodes, W. F. Eakin, T. P. Henderson and others.

### FLOUR, FEED AND MEAL MILLS

Ky., Williamstown.—Williamstown Mill & Light Co., capital stock \$15,000, incorporated by J. M. Riley, J. W. Shields, R. L. Webb and others.

Ky., Seabree.—Seabree Light & Milling Co. incorporated by John B. Ramsey and others. (See "Electric Plants.")

Va., Chase City.—South Side Supply Co., Box 93, Charles M. Boswell, president, will expend \$5000 to erect flour mill; mill construction; day labor; daily capacity, 40 barrels of flour; machinery purchased. (Recently noted.)

W. Va., Keyser.—W. B. Wolfe awarded contract to C. W. Shelly of Keyser to rebuild old mill formerly owned by Keyser Milling Co.

N. C., Asheboro.—Southern Crown Milling Co., capital stock \$50,000, incorporated by W. F. Reedling, C. C. Cranford and others.

### FOUNDRY AND MACHINE PLANTS

Ala., Anniston.—Locomotives.—Kilby Locomotive and Machine Works will build addition for forging car axles; building 60x60 feet; steel construction with sheet-iron sides; install steam hammer weighing 5000 pounds; also install shears and other machinery for manufacturing axles.

Tenn., Chattanooga.—Acetylene-gas Machines.—G. F. Milton purchased building and will enlarge and improve; leased structure to Hercules Manufacturing Co., manufacturer of acetylene-gas machines.

Tex., Rusk.—Castings, etc.—Norman-Lewis Foundry & Machine Co. (recently noted incorporated, \$5000 capital stock) will erect 30x60-foot \$1200 building and install equipment at cost of \$5000; manufacture castings, sash weights and grates; daily capacity five tons; W. T. Norman, president and treasurer; Jas. Kerr, secretary; W. H. Lewis, vice-president and manager. (See "Machinery Wanted.")

Va., Appalachia.—Machine Works.—Appalachian Machine Works, J. H. Skaggs, president, and R. H. Masters, manager (recently noted incorporated, \$10,000 capital stock), will erect 25x90-foot building; private contract; install equipment costing \$1000. (See "Machinery Wanted.")

### GAS AND OIL ENTERPRISES

Ark., Little Rock.—Spear-Hart Oil Co., capital stock \$20,000, incorporated by Henry Spear, H. Van E. Hart and Mrs. Henry Spear.

Okla., Collinsville.—Olga Oil & Gas Co., capital stock \$5000, incorporated by C. L. Goodale, Harry D. Barndollar, I. M. Goodale and G. M. Barndollar.

Okla., Guthrie.—Dunn-Swartz Oil, Gas & Mineral Co., capital stock \$45,000, incorpo-

rated by W. M. Swartz and George L. Kuhn of Guthrie, J. L. Dunn of Dunn Station, Pa., and others.

Okla., Oklahoma City.—Alert Oil Co., capital stock \$30,000, incorporated by R. M. Conway, E. R. Houghton and H. B. Houghton.

Okla., Oklahoma City.—Kingland Oil & Gas Co., C. E. King, vice-president, 427 American National Bank Bldg., will develop oil property; opens bids April 15 for equipment; recently noted incorporated with \$45,000 capital stock. (See "Machinery Wanted.")

Okla., Oklahoma City.—Bert Lewis Oil & Gas Co., capital stock \$12,000, incorporated by W. N. Hayes, B. L. Schlosinger, W. A. Fulwiler and J. W. True.

Okla., Oklahoma City.—Nebo Oil & Gas Co., capital stock \$25,000, incorporated by L. H. Prichard, B. W. Griffith, Jr., and D. A. Duncan.

Okla., Tulsa.—Yellow Pine Oil & Gas Co., capital stock \$15,000, incorporated by C. J. Mead and Roy Lundy, both of Tulsa, and V. V. Morgan of Muskogee, Okla.

Okla., Tulsa.—Topeka Oil & Gas Co., capital stock \$5000, incorporated by William M. Ross, J. K. Cleary and Philip Kates.

Okla., Tulsa.—Atlas Gasoline Co., capital stock \$10,000, incorporated by W. M. Black, R. E. Browning and W. D. Abbott.

Okla., Tulsa.—Soap Oil Co., capital stock \$12,000, incorporated by E. A. Ross, E. M. Arnold and H. N. Greis.

Tex., Austin.—Gas Plant.—Austin Gas Light Co. will build auxiliary coal gas plant; three benches and six retorts; capacity, 120,000 cubic feet gas.

Tex., Dallas.—Oil Refinery.—Oriental Oil Co., W. S. Smith, president, Jackson and Lane Sts., awarded contract to Hammond Iron Works of Warren, Pa., to build oil refinery; brick and concrete buildings, storage tanks, etc.; daily capacity 2000 barrels; 21 steel storage tanks with capacity of 100,000 barrels oil; site 25 acres; 1500 feet side-track.

Tex., Denton.—Denton Oil & Gas Co., capital stock \$5000, incorporated by C. F. Evans, C. F. Witherspoon and John A. Hann; leased property near Denton; will develop.

Tex., Electra.—Forest Oil Co., capital stock \$300,000, will be incorporated to develop oil properties; controls 72 acres at Electra and four acres near Iowa Park; W. W. Johnson, president, Mineral Wells, Tex.; G. E. Wilson, vice-president, Electra; T. W. Owen, secretary-treasurer, Electra; J. M. Hartsfield, assistant secretary, Fort Worth, Tex.

Tex., Hereford.—Panhandle Oil Development Co., capital stock \$30,000, incorporated by H. B. Webb, S. B. Edwards and T. E. Shilry.

Tex., Port Arthur.—Gas Plant.—J. C. Connelly is arranging to construct \$100,000 gas plant; has franchise.

Tex., San Antonio.—Gas Plant.—San Antonio Gas & Electric Co. includes appropriation of \$50,000 in its 1913 budget for extension of gas mains; improvements proposed will include construction of belt line or transmission system from plant near International & Great Northern Railroad depot to Government Hill and extension of smaller mains. (See "Electric Plants.")

W. Va., Fairmont.—Northwestern Oil Co., capital stock \$25,000, incorporated by Brooks Hutchinson, F. B. Pryor, G. A. Hill and others.

W. Va., Parkersburg.—Claremont Oil Co., capital stock \$64,000, incorporated by J. R. Anderson, E. P. Anderson, M. McNicholas, J. A. Saunders and Mary B. McNicholas.

W. Va., Shinnston.—H. P. Boone Oil & Gas Co., capital stock \$10,000, incorporated by J. D. McGee, W. I. Booth, H. P. Boone and others.

### ICE AND COLD-STORAGE PLANTS

Ala., Anniston.—F. W. Ledbetter, 1423 Gurnee Ave., and associates are proceeding with construction of proposed ice plant; building and foundations for machines practically completed; operation contemplated for middle of May or sooner.

Ark., Monticello.—Drew Oil Mills will install 20-ton ice plant, to be operated in connection with present cottonseed-products plant. (See "Machinery Wanted.")

Fla., St. Petersburg.—A. C. Phell, Mayor, states city will not construct ice plant recently mentioned.

Fla., Tampa.—Florida Brewing Co. will erect cold-storage plant in Ybor City; brick; metal roofing; cost \$7000.

Mo., St. Louis.—Rock Island-Frisco Terminal Co., W. C. Nixon, president, contemplates

building fruit depot; second floor to be equipped as cold-storage plant, with probable capacity of 750 carloads fruit. (See "Warehouses.")

N. C., Mantoe.—J. D. Lloyd of New York and associates contemplate, it is reported, building cold-storage plant and fishery.

N. C., Monroe.—J. W. Hines of Rocky Mount, N. C., purchased plant of Monroe Ice & Fuel Co.; will improve and operate.

S. C., Bishopville.—Bishopville Ice & Fuel Co., J. S. Corbett, president, purchased equipment for recently-noted ice plant; 10 tons daily capacity; erect galvanized iron building; construction by owner. (See "Machinery Wanted.")

### IRON AND STEEL PLANTS

Okla., Arkhoma (not a postoffice).—Rolling Mill.—Fort Smith Iron & Steel Co., Fort Smith, Ark. (recently noted incorporated, capital stock \$50,000), will produce bar iron and steel; erect mill-construction buildings; plans not settled; James W. Arnold, president and manager; M. W. Murray, secretary-treasurer; John H. Vaughn, vice-president.

### LAND DEVELOPMENTS

Ala., Brighton.—Brighton Cemetery Co., capital stock \$5000, incorporated; J. H. Davis, president-secretary; Mary E. Wagensler, vice-president.

Ala., Epes.—Dr. P. G. Manley and W. E. Keen of Mt. Carmel, Ill., purchased 2000 acres black land between Epes and Gainesville, Ala., and will conduct mule-breeding farm; develop 1200 acres for pasture and balance for corn, oats, alfalfa and grass.

Fla., Jacksonville.—Springfield Development Co., capital stock \$70,000, incorporated; Henry C. Aird, president; C. M. Sandusky, vice-president; C. L. Jennings, second vice-president; Frank E. Wood, secretary; J. E. Johnson, treasurer.

Fla., Jacksonville.—Model Farm Co., capital stock \$250,000, incorporated; J. E. Johnson, president; J. F. Horne, vice-president; J. C. Lanier, secretary; F. G. Johnston, treasurer.

Fla., Miami.—Cocoplum Beach Co., capital stock \$25,000, incorporated; purchased 500 acres water-front property and will develop as residential section; John Gifford, president; L. R. Allen, vice-president; J. A. Williams, second vice-president; D. C. Caddagan, secretary; R. M. Price, treasurer.

Fla., Tampa.—Tampa Kissengen Wells Co. organized with \$250,000 capital stock; has 68 acres, portions of which will be devoted to dwelling sites, hotels, etc.; remaining 20 acres for company's wells, springs, etc.; improvements (as lately noted) will include bathhouses, sanitarium, amusement sheds, etc.; cost \$50,000; details not arranged.

Fla., Zona.—Company has been incorporated with \$12,000 capital stock for farming and trucking 700 acres land at Zona; plant 100 acres in eggplants, tomatoes, etc.; W. S. Brooke is secretary.

Ga., Savannah.—West End Development Co., capital stock \$60,000, incorporated by H. P. Howard, T. F. Cook and C. J. Hunter.

Louisiana.—Louisiana Agricultural Corporation, capital stock \$300,000, chartered by H. E. Latter, W. J. Maloney and N. P. Coffin, all of Wilmington, Del.

La., New Orleans.—Bush-St. Martin Land Co., capital stock \$50,000, incorporated; L. B. Maginnis, president; John F. Couret, vice-president; George Janvier, secretary; Chas. Janvier, treasurer.

Md., Baltimore.—Washington-Baltimore Land Co., capital stock \$50,000, incorporated by R. Boyd Cooling, Clarence J. Jacobs and Harry W. Davis, all of Wilmington, Del.

N. C., Asheville.—J. S. and J. Davis Porcher purchased 170 acres land and will improve for truck farm; later will plant orchards on mountain slopes.

N. C., Cape Lookout (not a postoffice).—Cape Lookout Land & Improvement Co., American National Bank Bldg., Richmond, Va., capital stock \$200,000, incorporated; E. H. Howe, president, Richmond; Charles P. Pearson, vice-president, Lagrange, Ga., and C. K. Howe, secretary-treasurer, Beaufort, N. C.; develop about 600 acres; erect hotel, cottages, etc., at resort in connection with deep water terminus; Mr. Howe is engineer in charge.

Okla., Bristow.—City voted \$20,000 bond issue to purchase parks and improve same. Address The Mayor.

S. C., Belfast, R. F. D. from Klnards.—

Belfast Plantation Co., capital stock \$35,000, incorporated by J. J. Walker of Barnwell, S. C., and others.

Tenn., Knoxville.—Greenwood Cemetery Co. reorganized and increased capital stock from \$10,000 to \$100,000.

Tenn., Memphis.—J. H. Wadlington and W. E. Stansbury purchased 71 acres on Poplar Blvd.; will open new streets and subdivide property.

Tex., Beaumont.—Tillery-Gilbert Farm Co., capital stock \$10,000, incorporated by M. Tillery, W. C. Gilbert and L. F. Gilbert.

Tex., Dallas.—Reliance Land Co., capital stock \$200,000, incorporated by F. J. Cole, T. J. Britton and J. T. Elliott, Jr.

Tex., El Paso.—Alamo Heights Co., capital stock \$30,000, incorporated by C. H. Leavell, H. J. Simmons and U. S. Stewart.

Va., Richmond.—Boxville-Opequon Farms, capital stock \$250,000, incorporated; Wm. H. P. Root, president; Charles Stockdell Gray, secretary; Ray Vance, treasurer; all of New York.

### LUMBER MANUFACTURING

Ky., Louisville.—Booker-Cecil Lumber Co., capital stock \$50,000, incorporated by P. G. Booker, S. R. Cecil and John Churchill.

La., Hammond.—Genesee Lumber Co., Genesee, La., and Houlton Lumber Co., Houltonville, La., purchased yellow pine timber on tract near Hammond, and will manufacture at their Genesee and Houltonville plants.

La., Batchelor.—Northern Lumber Co. will increase capacity of plant and improve logging facilities; purchased additional timber land.

La., Slidell.—Pine Products Co. will install additional machinery, doubling capacity.

La., Ruston.—Louisiana Lumber & Manufacturing Co., capital stock \$50,000, organized; purchased plant of Short-Leaf Lumber Co.; will rebuild and install planing machinery.

La., Ruston.—R. H. Sutton and Wesley Davis purchased yellow-pine timber land; will install sawmill (daily capacity, 30,000 feet) and planing mill.

Miss., Baxterville.—Coney Lumber Co., capital stock \$100,000, organized by E. O. Coney and associates; purchased timber land, will build circular-saw mill with daily capacity of 40,000 feet; drykilns and logging road, and later build planing mill.

Miss., Houlika.—Ferguson-Palmer Company, Paducah, Ky., will erect 40x300-foot sawmill building, 38x46-foot boiler-room, 20x52-foot engine-room and 36x45-foot machine shop and filling-room; ordinary construction; cost \$50,000; owner will erect; machinery and material ordered; also build 10 miles of railroad. (Recently noted.)

Miss., Moorhead.—John Dulweber Company will establish plant recently noted; erect \$25,000 ordinary mill-construction building; F. L. Gill, Moorhead, architect and construction engineer; install eight-foot band mill and 12-inch resaw; daily capacity 50,000 feet hardwood; B. F. Dulweber, president, treasurer and manager; J. E. Dulweber, vice-president.

Mo., Caruthersville.—Little River Lumber Co., capital stock \$25,000, incorporated by H. W. Barrick and Glenn and R. E. Frye; plans to build and operate saw and planing mills.

N. C., Graham County.—J. M. English, Robert Greenwood and T. E. Blackstock of Asheville, N. C., purchased 3000 acres hardwood timber, 2,500,000 feet dry lumber, seven-foot band-saw mill, five-mile tramroad, logging engine and other equipment; will at once arrange to manufacture lumber, 30,000 to 40,000 feet daily; probably will incorporate company; reported purchase price about \$125,000.

S. C., Columbia.—Acme Lumber Co., capital stock \$400, incorporated by A. P. Howie, C. S. Monteth and G. R. Rembert.

Tenn., Memphis.—Memphis Band Mill Co. purchased Memphis Sawmill Co.'s mill and equipment and will continue plant; daily capacity, 40,000 feet hardwood lumber; James F. McSweyn, president; George McSweyn, vice-president; Otis A. Folger, secretary, Grand Rapids, Mich. (Recently noted incorporated with \$100,000 capital stock.)

Tex., Bastrop.—Jay C. Power, San Antonio, Tex., will develop 8000 acres timber land; after timber is removed property will be divided into 10-acre tracts and sold.

Tex., Corpus Christi.—Nueces Lumber Co., capital stock \$10,000, incorporated by John J. Kuntz, Roy S. Hollingsworth and Wyatt Cargile.

Tex., Rebecca.—Caney Creek Lumber Co., J. L. Thomas, president (recently noted in-

corporated, \$3000 capital stock), is proceeding with erection of mill-construction building; no further machinery needed; daily capacity 25,000 feet yellow pine.

Va., Cleveland.—Glade Hollow Lumber Co. purchased timber land and will develop.

Va., Norfolk.—Old Dominion Marine Railway will install saw and planing mills; install resaws, band saws, circulars and planers.

W. Va., Cloverlick.—F. S. Wise of Marlinton, W. Va., purchased timber land near Cloverlick and will install plant.

### MINING

Ark., Zinc-Zinc.—G. W. Taylor, W. W. Doolen, Bud Lawhorn and Arch Hiltlen leased zinc mine and will develop.

Ga., Dahlonega.—Gold, Silver, etc.—Bullion Extraction Co., capital stock \$100,000, incorporated by C. R. Arnold of Dahlonega, M. F. Burke of Boston, Mass., and A. J. Hoskin of Denver, Col.

Ky., Louisville.—Stone.—Peter-Burghard Stone Co. increased capital stock from \$100,000 to \$200,000.

Mo., St. Louis.—Hummel Mining & Development Co. (recently noted incorporated, capital stock \$10,000) will make development; contracted for machinery; Aug. G. Hummel, president; E. P. Porter, vice-president; C. K. Reifsnider, secretary-treasurer, 800 Pine St.

Mo., Webb City.—Lead and Zinc.—Good Shepherd Mining Co. will rebuild mill recently reported burned at estimated loss of \$15,000.

Va., Mineral.—Boyd-Smith Mines, capital stock \$100,000, incorporated; R. A. Dunlop, president; Thomas C. Gordon, secretary-treasurer, both of Richmond, Va.

### MISCELLANEOUS CONSTRUCTION

Fla., Port Tampa.—J. W. Morris, general forwarding agent Atlantic Land & Improvement Co., advises as follows relative to new coal-handling plant: Coal dock for elevator is now being rebuilt and will soon be ready for machinery; iron and steel superstructure; single bridge tramway on two towers, spanning full width of dock, about 250 feet; structure to have unity movement along dock, about 700 feet; steam operation; handling capacity, 100 tons per hour; dock storage capacity, 20,000 tons; approximate cost, \$50,000.

Fla., Kissimmee.—Dock.—R. H. Ludlan, City Engineer, submitted to City Council profiles and estimates for construction of municipal dock; estimated cost \$13,300.

Ga., Atlanta.—Mausoleum.—Southern Mausoleum Co., W. C. Webber, general manager, 610 First National Bank Bldg., Nashville, Tenn., states that no definite plans or specifications have yet been prepared for recently noted proposed mausoleum at Atlanta.

Ga., Savannah.—Wharves.—Central of Georgia Railway, C. K. Lawrence, chief engineer is arranging to contract for rebuilding Merchants and Miners' terminals; call for main building paralleling river front 1100 feet long and 125 feet wide; general construction of pine; roof to be composed of two sheds each 40 feet wide connecting in center with cupola 36 feet wide and 35 feet high at highest point; galvanized iron covering; three firewalls 18 inches thick at inland side of building, where four tracks will be laid; local delivery shed to be 500 feet long and 95 feet wide, with two firewalls; steamship docks adjacent to water front. (Recently mentioned.)

Ga., Tybee.—Wharf, etc.—City will construct public wharf and approach at Tybee Inlet; bids received at office of F. W. Storer, clerk of Council, 205 E. Bay St., Savannah, Ga. (See "Machinery Wanted.")

Ky., Cadiz.—Dam.—Adams Bros., R. F. D. No. 2, will construct dam 60 feet long, 15 feet high, 8-foot base and 5-foot top; bids invited. (See "Machinery Wanted.")

Miss., Pascagoula.—Wharves, etc.—Government awarded contract to T. M. Favre of Gulfport, Miss., to construct wharves, warehouse and shipyard on Lowry Island.

Mo., St. Louis.—Subway.—Legislature authorized city to issue \$30,000,000 bonds to construct subway. Address The Mayor.

Mo., St. Louis.—Heating Plant.—Catholic Cathedral secured permit to erect proposed boiler-house for heating plant; 15 feet above ground and 15 feet below; structure will be connected with cathedral by tunnel; latter will carry steam pipe and have headroom on 7 feet; Pelligrin Construction & Investment Co. of St. Louis has contract to construct boiler-house and tunnel; plans by Barnett, Haynes & Barnett of St. Louis,

architects for church. Modern Heating Co. of St. Louis has contract to install heating plant, and Eclipse Electrical Co. of St. Louis to install electrical wiring.

N. C., Beaufort.—Breakwater, etc.—Beaufort Terminal Railroad Co. (E. C. Duncan of Raleigh, N. C.; W. B. Rodman and Morris S. Hawkins of Norfolk, Va., incorporators) has obtained charter recently applied for; is capitalized at \$5,000,000 and has right to issue bonds; latest report states this corporation will build railway from Beaufort to Cape Lookout and there construct for Government breakwater to furnish harbor for shipping below Cape Hatteras, this Government work to cost \$5,000,000; total of \$1,400,000 already appropriated; understood that Beaufort company is allied with Norfolk Southern Railroad, Charles H. Hix, president and general manager, Norfolk, Va. (Recently mentioned.)

N. C., Bessemer City.—Underpass.—Southern Railway Co. awarded contract to Parker & Boyd, Charlotte, N. C., to erect reinforced concrete underpass beneath main line of passenger tracks; cost about \$8000 to \$9000.

Tex., Allenfarm.—Levee.—Allenfarm Precinct of Brazos county voted \$10,000 bond issue to complete, improve and maintain levee heretofore constructed to protect farms. Address Precinct Commissioners.

Tex., Port Arthur.—Wharf Improvement.—Kansas City Southern Railway, C. E. Johnston, chief engineer, Kansas City, Mo., will improve facilities for loading and unloading at wharf.

Va., Alexandria.—Block Signals.—Southern Railway Co., B. Herman, chief engineer, 1300 Pennsylvania Ave., Washington, D. C., will install automatic electric block signals on railway between Alexandria terminals and Orange, Va., 78 miles; to connect with block system of Washington Terminal Co., thereby making entire line from Washington to Orange under automatic electric block signal operation.

W. Va., Huntington.—Subway.—City contemplates voting on \$30,000 bond issue to construct subway at 11th St. Address Mayor Chapman.

### MISCELLANEOUS ENTERPRISES

Ark., Benton.—Laundry.—Benton Steam Laundry (recently noted incorporated, \$3500 capital stock) will establish laundry and cleaning plant; erect 30x80-foot frame building, with steel siding and brick front; install machinery; C. E. Shoemaker, president; J. E. McEwen, vice-president; C. H. Becker, secretary-manager.

Fla., St. Petersburg.—Publishing.—Evening Independent awarded contract to H. W. Plunkett to erect additional story to office building and alter and enlarge present building; install printing press and linotype machine; plans by Bonniwell & Son, Tonawalla Bldg., St. Petersburg. (Recently mentioned.)

Fla., Tarpon Springs.—Publishing.—"The Progressive" will be name of printing plant recently noted to be established by E. L. Zimmerman, Box U; weekly newspaper and job printing; equipment mainly supplied. (See "Machinery Wanted.")

Ga., Athens.—Publishing.—Louis Morris will erect building to be occupied by Hartwell Sun; awarded contract for construction.

Ga., Rome.—Laundry.—United Laundry Co. will be incorporated by Paul Jack, M. M. Jack and C. D. Quick.

Ga., Savannah.—Incinerator.—City will construct garbage destructor plant. Address The Mayor.

Ky., Burkesville.—Publishing.—Burkesville Banner Publishing Co. will rebuild plant recently reported burned at estimated loss of \$1500.

Ky., Burnside.—Water Transportation.—Burnside & Burkesville Transportation Co., capital stock \$30,000 incorporated by A. B. Massey, K. E. Massey and R. F. K. Cole.

Ky., Henderson.—Construction.—Cement Construction Co., capital stock \$25,000, incorporated by J. Stanley Spooher, Ingram Crockett, Charles D. Williams and A. L. Smith.

Ky., Maysville.—Abattoir.—William W. Weis will build abattoir.

Ky., Owensboro.—Publishing.—Searchlight Publishing Co., capital stock \$1000, incorporated by Mrs. C. G. Stuart, R. M. Stuart and G. W. Thompson.

Mo., Kansas City.—Incinerator.—City awarded contract to Lewis & Kitchen of Kansas City at \$41,985 to erect garbage and refuse incinerator; daily capacity 75 tons; E. J. McDonnell, secretary Board of Public Works. (Call for bids lately noted.)

Mo., Kansas City.—Rock Crushing.—Corrigan Rock Crushing Co., capital stock \$3000,

incorporated by F. J. Dwyer, E. J. Corrigan and Edward Corrigan.

Mo., Kansas City.—Presto-O-Lites.—Presto-O-Lite Co., Indianapolis, Ind., opens bids about June 1 to erect fireproof plant; cost \$12,000; C. B. Floyd, Indianapolis, engineer in charge.

Mo., St. Louis.—Electrical Contracting.—Behr Electrical Contracting Co., capital stock \$6100, incorporated by Charles B. Behr, Aaron A. and Rose B. Behr.

Mo., St. Louis.—Garbage Plant.—Board of Public Improvements contemplates construction of garbage incinerator; Legislature authorized \$10,000 appropriation to engage engineer to prepare plans and specifications, etc.

Mo., St. Louis.—Laundry.—William H. Putnam contemplates erecting laundry.

Mo., St. Louis.—Roofing.—Commercial Roofing Co., capital stock \$3000, incorporated by Thomas J. McDermott, Dick H. Hogan and Robert E. Hogan.

N. C., Jefferson.—Publishing.—Cyrus H. Smith contemplates publication of weekly newspaper; will install equipment. (See "Machinery Wanted.")

N. C., Oxford.—Publishing.—Granville County Publishing Co., capital stock \$5000, incorporated; Jas. W. Horner, president; J. C. Haskins, vice-president; John W. Hester, secretary-treasurer; probably rent building; receiving bids on machinery, cost within \$3000. (See "Machinery Wanted.")

N. C., Raleigh.—Laundry.—Excelsior Laundry Co., capital stock \$25,000, incorporated by W. S. West, N. A. Dunn, R. W. Dunn and Howard Haywood; will continue established plant.

Okla., Clinton.—Publishing.—Clinton News Publishing Co., Richard A. Billups, president (recently noted incorporated, \$5000 capital stock), will conduct job printing and publish Clinton News (weekly).

Okla., Guthrie.—Cresosoling.—Louisville & Nashville Railroad, W. H. Courtenay, chief engineer, Louisville, Ky., will, it is reported, build cresosoling plant.

S. C., Bethune.—Publishing.—Bethune Observer, capital stock \$1000, incorporated; D. T. Yarborough, president; J. M. Forbes, vice-president; A. B. McLaurin, treasurer.

S. C., Greenville.—Publishing.—Piedmont Publishing Co., capital stock \$10,000, incorporated; George R. Koester, president; Harold C. Booker, vice-president; Joseph W. James, secretary-treasurer.

Tenn., Memphis.—Cattle.—Dairymen's Co-operative Cattle Co., capital stock \$10,000, incorporated by W. S. Biles, Max Henning, Abe Goodman and others.

Tenn., Nashville.—Dairy.—Nashville Pure Milk Co. contemplates increasing capital stock from \$15,000 to \$25,000.

Tex., Wharton.—Printing.—Wharton Spectator Printing Co., capital stock \$8000, incorporated by B. R. Taylor, F. W. Shannon and W. L. Hall.

Va., Petersburg.—Transfer.—Mutual Transfer Co., capital stock \$50,000, incorporated; Mortimer Williams, president; W. A. Totty, vice-president; W. J. Purdy, secretary-treasurer.

Tex., San Antonio.—Engineering.—San Antonio Engineering & Construction Co., capital stock \$10,000, incorporated by J. C. Neely, C. E. McStravick and W. D. Riddell.

Tex., Sherman.—Laundry.—Family Steam Laundry Co., capital stock \$3000, incorporated by Ed B. Coraway, Frank Kote and Bonner White.

Va., Richmond.—Dairy.—Richmond Dairy Co. will erect building; frontage 130 feet; cost \$61,300; plans prepared.

W. Va., Martinsburg.—Grain Elevator.—Cumberland Valley Railroad, G. C. Koons, engineer, Chambersburg, Pa., will rebuild grain elevator recently reported burned; reported cost \$35,000.

W. Va., Wheeling.—Dyeing, Cleaning, etc.—McClaskey Cleaning Co., 1126-1140 Chapline St., incorporated with \$5000 capital stock by M. A. McClaskey, A. S. Paul, H. S. Bloch and others.

### MISCELLANEOUS FACTORIES

Ark., Jonesboro.—Folding Cases.—W. R. Vaughn and F. M. Steuteman of St. Louis, Mo., are conferring with Jonesboro Business Men's Club relative to establishment of folding-case factory.

Ark., Paragould.—Ice Cream.—Ideal Ice Cream Co., capital stock \$5000, incorporated by P. C. Ritter and George Dover; ordered equipment.

Fla., Jacksonville.—Turpentine, etc.—Southern Rosin-Turpentine Co., capital stock \$5000, incorporated; J. G. Gardner, president; J. P. Cartin, vice-president-secretary-treasurer.



Fla., Key West—Cigars.—M. A. Gunst & Co., Tampa, Fla., engaged McGucken & Hyer of Tampa, Fla., to supervise erection of cigar factory; reinforced concrete; 280x190 feet; cost \$60,000.

Ga., Atlanta—Overalls.—Nunnally McCrea will erect building to be equipped as overall factory by Marcus Loeb & Co.; structure will be four stories; fireproof; reinforced concrete; cost \$45,000.

Ga., Savannah—Tires.—Savell Rubber Tire Co., capital stock \$25,000, incorporated by W. R. Savell, W. W. Horndell and Charles Savell.

Ky., Louisville—Pipe Covering.—Kentucky Pipe Covering Co. increased capital stock from \$299 to \$10,000.

Ky., Paducah—Distillery.—Old Terrell Distilling Co. will rebuild distillery recently reported burned at estimated loss of \$15,000.

Ky., Paducah—Churns.—Coleman Churn Operating Mechanism Manufacturing Co. incorporated with \$24,000 capital stock; W. H. Coleman, manager, 1335 Trimble St.; will manufacture churns; plant to be operated at present in connection with Fooks Lumber & Construction Co.'s plant; springs will be manufactured by contract at first; probable daily capacity 100 churns; recently noted as Old Way Made Easy Churn Manufacturing Co. (See "Machinery Wanted.")

La., Shreveport—Bottling.—Star Bottling Works will erect building for bottling plant and storing candy; brick; one and one-half stories; 54x140 feet; cost about \$20,000; plans being prepared.

Md., Baltimore—Showcases.—Reinle-Salmon Company, Stockholm and Warner Sts., awarded contract to Fidelity Construction Co., Knickerbocker Bldg., Baltimore, to erect two additional stories to present two-story building; 112x40 feet; brick. (Recently mentioned.)

Md., Baltimore—Showcases.—F. N. Ganter Company, Leadenhall and Stockholm Sts., will erect two additional buildings.

Md., Baltimore—Hominy.—Baltimore Pearl Hominy Co., Howard and Ostend Sts., contracted with Consolidated Gas, Electric Light & Power Co., Continental Bldg., for electricity for power, aggregating 1200 horsepower, to operate plant.

Md., Baltimore—Storage Batteries.—Baltimore Electric Storage Co., capitalized at \$2,500,000, chartered by John G. Gray, S. S. Adams and M. B. F. Hawkins, all of Wilmington, Del. Mr. Gray is company's counsel.

Mo., St. Louis—Drugs.—Standard Products Co., capital stock \$200,000, incorporated by H. Converse, Edgar Roberts and W. C. Shields.

Mo., St. Louis—Enhalmers and Undertakers' Supplies.—Max Huncke Chemical Co., capital stock \$15,000, incorporated by John A. Will of St. Louis, Theodore J. Gishburne, Jr., C. E. Dederick and Caroline M. Gishburne of Kirkwood, Mo., and Sam White of Wichita, Kan.

Mo., St. Louis—Toilet Preparations.—Perry Chemical Co., 312 Granite Bldg., (recently noted incorporated, capital stock \$2000), W. J. Trevasakis, president, will manufacture toilet preparations, perfumery, etc.; rented building equipped. (See "Machinery Wanted.")

Mo., St. Louis—Shirts.—Hargadine-McKittick Dry Goods Co. leased 35,000 square feet floor space in building at 22d St. and Washington Ave., and will equip for shirt factory.

N. C., Hickory—Creamery.—Catawba Co-operative Creamery Co., J. W. Robinson, president, awarded contract to Whitener & Deal, Hickory, to erect 40x30-foot building; fireproof; plans by Q. E. Herman, Hickory; machinery mainly purchased; no bids; daily capacity 350 pounds butter and 50 gallons cream. (Recently noted.)

Okla., Mangum—Fly Screens.—Mangum Electric Fly Screen Co. (recently noted incorporated, \$6000 capital stock), will rent building and install electric-motor planing mill; R. F. Hayter, president; D. J. Carter, vice-president; Z. T. Pryse, secretary-treasurer. (See "Machinery Wanted.")

Okla., Sapulpa—Bedding.—Southwestern Bedding Co., capital stock \$10,000, incorporated by Henry J. Ward, L. R. Huff and Edward W. Scott.

S. C., Charleston—Hide and Bark.—Charleston Hide & Bark Co., capital stock \$12,000, incorporated by Walter B. Wilbur and J. J. Murray.

S. C., Sumter—Carboaming.—Imperial Carboaming Co., capital stock \$2000, incorporated by W. D. Gass, Jr., W. T. Hunter and J. M. Harrison, Jr.

Tenn., Knoxville—Appalachian Products Co., capital stock \$10,000, incorporated by

George B. Townsend, H. M. Simmonds, McD. Pettway, Charles H. Smith and J. M. Meek; will continue established plant.

Tenn., Memphis—Emergency Tire.—W. F. Beasley of Plymouth, N. C., is promoting organization of company to manufacture emergency automobile tire, etc.

Tex., Fort Worth—Creamery.—Nissley Creamery Co. increased capital stock from \$25,000 to \$50,000.

Tex., O'Quinn—Soap.—J. C. Melcher advises of proposed organization of company to develop kaolin and manufacture into soap.

Tex., San Antonio—Adding Machines.—Simplex Adding Machine Co. incorporated with \$150,000 capital stock by O. T. Gregory, E. M. Gregory and F. S. Burt.

Va., Manassas—Train Control.—Foreign Train Control Corporation, authorized capital stock \$250,000, chartered; H. B. Miller, president, Staunton, Va.; W. F. Hale, vice-president, Nokesville, Va.; Thomas H. Lion, secretary-treasurer, Manassas.

Va., Petersburg—Note Books.—Brown Patents Co., Clark J. Brown, president, 45 Sycamore St. (recently noted incorporated, \$25,000 capital stock), will install equipment and paper for manufacture of note books; capacity 1000 weekly. (See "Machinery Wanted.")

Va., Portsmouth—Bags.—G. G. Fisher & Bro., Baltimore, Md., secured site for bag factory on Norfolk & Portsmouth Belt Line Railroad; postoffice, Portsmouth. (Recently noted as "J. J. Fisher," under "Va., Norfolk.")

Va., Richmond—Lime Grinding.—William H. Mann, Governor, and George W. Kolner, Commissioner of Agriculture, decided to proceed with proposed establishment of lime-grinding plants, by State, to be operated by convict labor.

Va., Shawsville—Limestone Products.—Limestone Products Corporation, capital stock \$50,000, chartered; J. L. Vaughan, president; W. T. Doosing, secretary-treasurer, both of Shawsville; George Longcor, manager, Elliot, R. F. D. from Cambria, Va.

Va., Winchester—Medicine.—Whitlock Herb Medicine Co., capital stock \$5000, incorporated; W. J. Whitlock, president; J. L. Whitlock, vice-president; O. P. Ritter, secretary-treasurer.

W. Va., Charleston—Drilling Jar.—Sparks Drilling Jar Co., capital stock \$20,000, incorporated by William A. Ouley, C. W. Swisher, John L. Dickinson and others; will establish plant to have daily capacity of 10 drilling jars.

W. Va., Huntington—Mattresses.—Standard Mattress Co., capital stock \$50,000, incorporated by Charles Gough, D. C. Helmick, S. C. Hennen and others; will locate at 201-223 21st St.

W. Va., Wheeling—Drugs.—Hoge-Davis Drug Co., capital stock \$25,000, incorporated by John C. Davis and Mary R. Davis of Wheeling, Ernest K. Hoge, Katherine Hoge and W. L. Noble of Martins Ferry, O.

### MOTORS AND GARAGES

Ala., Birmingham—Garage.—J. W. Minor, Brown-Marx Bldg., will open proposals May 1 for erection of recently-noted garage; one story; 50x125 feet; brick and concrete; wood doors and sash; cost \$6000; plans by D. O. Whildin, Birmingham.

Fla., Jacksonville—Garage.—L. T. Smith, 2379 St. John's Ave., awarded contract to erect garage, etc. (See "Dwellings.")

Fla., Orlando—Garage.—J. P. Holbrook and H. R. Berry contemplate building garage; 40x75 feet; one story; brick.

Ky., Louisville—Automobiles.—American Manufacturing & Distributing Co., capital stock \$10,000, incorporated by Harry L. Archey of Indianapolis, Ind.; P. H. Block of Cincinnati, O., and H. B. Morrow of Pittsburgh, Pa.

Md., Baltimore—Garage.—M. Solmsion, Bayard and Nanticoke Sts., will erect addition to garage for Apartment Garage Co., White-lock and Callow Ave.; 80x160 feet; brick and steel construction; extension of present steam-heating system; slag roof; cost \$7000; plans and construction by owner.

Md., Cambridge—Garage.—Phillips Hardware Co. awarded contract to W. L. Barnett & W. H. Thomas to erect proposed garage; 49x65 feet; three stories; brick and steel; hand-power elevator; slag roof; cost \$3500; cost of heating plant, \$600.

Mo., Kansas City—Garage.—Mrs. Virginia P. Johnson will rebuild burned garage; cost \$10,000.

Mo., Kansas City—Automobiles.—King City Motor Sales Co., capital stock \$10,000, incor-

porated by W. S. Hathaway, C. E. Hathaway and H. C. Page.

Mo., Kansas City—Garage.—Charles Atkin will erect garage salesroom; cost \$8000.

N. C., Asheville.—C. G. Memminger awarded contract to Wrenn & Garland, 60 S. Main St., Asheville, to erect garage and dwelling. (See "Dwellings.")

Tex., San Benito—Garage.—R. H. Frazier will erect garage and machine shop; two stories; brick; estimated cost \$15,000.

### ROAD AND STREET WORK

Ala., Birmingham.—City awarded following contracts for street paving: Southern Wood Block Paving Co. of Birmingham, 19th St. at \$13,554.90, Second Ave. at \$18,543.50 and Morris Ave. at \$4176.50; Southern Bitulithic Co. of Nashville, Tenn., Eighth Ave. at \$17,042.50; Southern Asphalt & Construction Co. of Birmingham, 24th St. at \$13,630, Beech St. at \$2542.50, 14th St. at \$5873.50 and Ash St. at \$1439.50; total \$76,602.90; Walter G. Kirkpatrick, City Engineer. (Recently mentioned.)

Ala., Choccoloco.—Goodrich & Crinkley of Anniston, Ala., have contract and are preparing to begin construction of proposed road in Choccoloco Valley; estimated cost, \$18,000.

Ala., Cullman.—Cullman county voted bond issue of \$200,000 for road construction; will build about 70 miles pike roads, comprising all main roads leading into city, along railroad, for average distance of five miles; macadam roads; Lot Jones, engineer in charge; R. I. Burke, Judge of Probate; bids will be asked by County Commissioners. (Previously noted.)

Ala., Dadeville.—City contemplates macadamizing main streets; estimated cost of improvements under consideration \$15,000. Address The Mayor.

Ala., Florence.—City will construct concrete sidewalks on Military Ave. Address The Mayor.

Ala., Gadsden.—City will construct 1334 square yards concrete sidewalks, 3000 linear feet 8-inch curb and 36-inch gutter, 200 linear feet 6-foot gutter, 200 cubic yards excavation, etc.; bids received April 7; Charles L. Marsh, City Engineer. (See "Machinery Wanted.")

Fla., Fort Myers.—City voted \$47,000 bond issue for street paving. Address The Mayor.

Fla., Orlando.—City will petition Legislature for authority to issue \$100,000 of bonds to pave about 11 miles of street with vitrified brick; property-owners to pay one-half cost, making total amount to be expended \$200,000.

Fla., Tampa.—City will lay 200,000 square yards vitrified brick pavement, using either sand, cement or asphalt filler; bids received until April 1; D. B. McKay, chairman, Commissioners of Public Works; Allen Thomas, Clerk; this work lately mentioned. (See "Machinery Wanted.")

Fla., Plant City.—City voted \$35,000 bond issue for paving. Address The Mayor. (Recently mentioned.)

Fla., Orlando.—Orange, Volusia and Brevard counties contemplate constructing road from Titusville to Orlando, 40 miles; James L. Giles, M. M. Smith and others, committee.

Ky., Fulton.—City sold \$40,000 bond issue for street improvements. Address The Mayor.

Ky., Louisville.—Fiscal Court receives bids until April 1 for maintenance of following roads for one year: River road, Brownsboro, Shelbyville, Taylorsville, Bardstown, Preston-street, Third-street, Eighteenth-street and Cane Run roads, outside city of Louisville; reconstruction of Seventh-street road from Bernheim lane to St. Helena; also construction of Eighteenth-street road from end of present macadam to Salt River bridge; J. Russell Gaines, County Road Engineer. (See "Machinery Wanted.")

La., Iberia.—Iberia parish will vote late in April or early in May on issuance of previously-noted \$126,000 for road construction; W. L. Burke, secretary Police Jury.

La., Mansfield.—City Council will meet April 1, when definite plans will be made and contract probably let for paving, etc.; J. M. Rogers, secretary. (See "Water-works.")

La., New Iberia.—City will pave 12 miles cement sidewalks; City Engineer instructed to prepare plans and specifications. Address The Mayor.

Md., Baltimore.—City will grade, curb and pave with vitrified block, granite block, sheet asphalt and bituminous concrete on concrete base the following: Contract No. 52, 13,920 square yards vitrified block; Contract 53, 16,650 square yards granite block; Contract 54, 3029 square yards sheet asphalt,

2000 square yards concrete and 2570 square yards vitrified block; bids received until April 2; R. Keith Compton, chairman Paving Commission. (See "Machinery Wanted.")

Md., Elkton.—Cecil County Commissioners will construct macadam road from Clayton's Corner, near Chesapeake City, to Delaware line, 2½ miles; appropriated \$10,000 to gravel road from Battle Swamp to Port Deposit and \$10,000 to gravel road from Bayview to Calvert.

Miss., Macon.—Noxubee County District No. 2 will construct about five miles gravel and five miles sand-clay road; include about 34,000 yards earth excavation and hauling, spreading and rolling of chert or gravel, etc.; plans with John A. Tyson, Chancery Clerk; bids received April 9. (See "Machinery Wanted.")

Mo., Fulton.—Commissioners Fulton Special Road District will improve about 15 miles of roads; receive bids for loading gravel from creek beds, hauling gravel and constructing roads until April 1; W. R. Hengler, engineer, Home Bank, Fulton. (See "Machinery Wanted.")

N. C., Hendersonville.—Hendersonville County Commissioners will order bond election in Hendersonville and Hoopers Creek townships to vote on \$50,000 and \$20,000 bond issue, respectively, for road construction.

N. C., Mooresville.—City has engaged Adlai Osborne, engineer, Charlotte, N. C., to prepare preliminary survey and estimate cost of street improvements and extensions to water-works; bond issue contemplated.

N. C., Rutherfordton.—Rutherford county votes April 23 on \$250,000 bond issue to construct roads. Address County Commissioners.

N. C., Statesville.—Iredell County Commissioners awarded contracts for grading 30 miles of road; J. T. Platt to grade Chipley Ford, Lewis Ford and Bonbo roads, and W. E. Graham to grade Shearer Chapel road.

Okla., Hennessey.—Town contemplates paving Main St. Address Town Clerk.

S. C., Columbia.—Richland county will construct road from city limits of Columbia through Shandon (suburb) as far as \$18,000 appropriation will permit; probably pave with bitulithic; Anderson Patterson, Jr., County Supervisor.

S. C., Darlington.—City awarded contract to Mr. Steele of Bennettsville, S. C., to pave sidewalk on Florence St.

Tenn., Bluff City.—Sullivan County Road Commission awarded contract to Oliver & Hill of Maryville, Tenn., to grade and macadamize 50-mile road; to be provided for out of \$200,000 bond issue; C. M. Dulaney, engineer, Blountville, Tenn. (Recently mentioned.)

Tenn., Camden.—Benton county defeated \$200,000 bond issue for road construction; W. D. Cooper, clerk. (Bond issue recently noted.)

Tenn., Morristown.—City awarded contract to Murray Construction Co., Knoxville, Tenn., for 16,379 square yards sheet asphalt guttering, grading and paving in improvement districts Nos. 2 and 3; requires 650 cubic yards excavation. (Call for bids lately noted.)

Tex., Cameron.—Justice Precinct No. 1 of Milam county will vote on \$150,000 bond issue for road construction. Address County Commissioners.

Tex., Fort Worth.—J. S. Travilla, engineer, submitted report to Tarrant County Commissioners, estimating cost of constructing eight cardinal and sub-cardinal roads at \$30,520 and recommending asphalt macadam and water-bound macadam; total mileage, 131.128; bond issue of \$1,000,000 previously voted. (Recently mentioned.)

Tex., Houston.—City awarded contract to Suderman & Dolson of Houston to pave streets in Central Park.

Tex., Linden.—Road District No. 7, Cass county, J. P. Fant, County Judge, will construct roads at cost of \$35,000; clay and sand; open bids April 10; L. L. Harper, County Clerk. (Bond issue recently noted.)

Tex., Port Lavaca.—Calhoun County Commissioners will construct 30 miles of gravel surfaced highway in Road District No. 2; bids received March 25; F. M. Dudgeon, County Judge. (See "Machinery Wanted.")

Tex., San Antonio.—San Antonio Gas & Electric Co. and San Antonio Traction Co. includes expenditure of \$100,000 in its 1913 budget for street paving and double track-ling. (See "Electric Plants.")

Tex., San Marcos.—City awarded contract to C. W. Maxwell to construct concrete street crossing around plaza.

Tex., Texarkana.—City will vote on \$250,000 bond issue to pave streets, etc.; H. W. Rannels, Mayor.

Tex., Valley Mills.—Bosque county voted \$40,000 bond issue for construction of about 20 miles of roads. Address County Commissioners.

Tex., Winnie.—Commissioners Precinct No. 4 of Chambers county voted \$100,000 bond issue to build and shell roads. Address County Commissioners, Anahuac, Tex.

Va., Danville.—Pittsylvania county will construct four sections of soil road, about 10 miles each, and 8 miles of macadam road in Dan River District; bids for any section or whole are invited until April 1; P. H. Terry, chairman of committee. (See "Machinery Wanted.")

Va., Gate City.—Johnson, Estville and Fulkerson Magisterial districts of Scott county will vote on \$150,000 bond issue to construct roads. Address County Commissioners.

Va., Orange.—Orange county will macadamize about 20 additional roads. Address County Commissioners.

Va., Richmond.—Administrative Board awarded contracts for about 100,000 square yards granite and smooth paving; J. C. Cheatwood of Richmond secured contract at total of \$58,500 for paving various streets, and John C. Weinbrunn of Richmond at total of \$12,500 for street paving; Washington Asphalt Block & Tile Co. (S. Capitol and R Sts.), Washington, D. C., and to Atlantic Bitulithic Co. of Richmond at total of \$90,000 for various street paving.

Va., Staunton.—S. D. Folsinger, general manager, states city road work is done by city force. (Recently noted to include \$60,000 in annual budget for street improvements.)

W. Va., Huntington.—City contemplates voting on \$250,000 for street paving and sewer construction. Address Mayor Chapman.

W. Va., Parkersburg.—City votes May 8 on \$300,000 bond issue for street paving. Address The Mayor. (Recently mentioned.)

W. Va., Princeton.—Mercer county votes April 22 on \$800,000 bond issue for permanently improving roads; E. L. Bowman, Clerk.

### SEWER CONSTRUCTION

Ala., Roanoke.—City votes May 1 on \$20,000 bond issue to construct sewer system; W. H. Mann, Mayor.

Ark., Monticello.—City desires bids for perfection of sewerage purification system now in operation; contractor to convert system into one for which contractor will deposit bond; contract probably awarded April 4; E. B. Wells, chairman sewerage committee. (See "Machinery Wanted.")

Ark., Walnut Ridge.—Town contemplates constructing sewer system. Address Town Clerk.

Fla., Fort Myers.—City voted \$6000 bond issue for extension of sewer system. Address The Mayor.

Fla., Plant City.—City voted \$5,000 bond issue to construct sewer system and \$5000 bond issue for drainage. Address The Mayor. (Recently mentioned.)

La., Mansfield.—City Council will meet April 1, when definite plans will be made and contract probably let for sewer improvements, etc.; J. M. Rogers, secretary. (See "Water-works.")

Md., Baltimore.—City will construct miscellaneous sanitary lateral sewers, contract No. 108, requiring following approximate quantities: 600 linear feet vitrified-pipe sewer, 8 to 10 inches diameter; 1900 linear feet vitrified-pipe house connections; plans and specifications at office of Sewerage Commission, Charles England, chairman, 904 American Bldg.; bids received until April 9. (See "Machinery Wanted.")

Miss., Clarksdale.—City will construct about 1120 feet 15 to 24-inch vitrified pipe sewer, with necessary manholes, catch-basins and connections; use 2200 linear feet 4 to 24-inch vitrified pipe, 25 barrels Portland cement, manhole covers, etc.; bids opened April 1; W. M. Purnell, City Clerk. (See "Machinery Wanted.")

Miss., Tutwiler.—City's plans for sanitary sewer construction (recently noted) will include one mile 8, 10 and 12-inch sewers, 8 manholes and 4 flush tanks; plans and specifications on file with J. L. Donald, clerk; bids received March 4 were rejected, and new bids will be received April 15; R. C. Huston & Co., Exchange Bldg., Memphis, Tenn., consulting engineer. (See "Machinery Wanted.")

Mo., Richmond.—City awarded contract to Lannder Construction Co., 3821 Bell St., Kansas City, Mo., at \$12,159 to construct sewer system and septic tank; 4640 feet 15-inch, 3176 feet 12-inch and 4445 feet 10-inch pipe; average depth of ditch, 5 feet; 40 brick

manholes and two-compartment concrete septic tank; Worley & Black, engineers, Reliance Bldg., Kansas City, Mo.; R. E. Brown, clerk. (Call for bids lately noted.)

N. C., Charlotte.—City bids for sewer construction, 1st St., etc., North Charlotte (recently noted to be received March 19), have been rejected; Executive Board will receive new bids April 2 for construction of about 18,221 feet 24-inch to 8-inch sewers and drains; also about 200 feet cast-iron pipe for creek crossings; A. H. Weara, City Clerk and Treasurer. (See "Machinery Wanted.")

N. C., Winston-Salem.—P. H. Hanes awarded contract to J. B. McCrary Company of Atlanta, Ga., to lay sewer and water mains in West Highlands, suburb.

Okla., Bristow.—City voted \$25,000 bond issue to construct sewer system. Address The Mayor.

Tenn., Nashville.—City awarded contract to T. I. Curtis & Son of Nashville at \$3977.75 to construct trunk sewer in Delta St.

Tex., Rosenberg.—City will construct sewer system and water-works to cost about \$30,000. Address The Mayor.

W. Va., Huntington.—City contemplates voting on \$250,000 bond issue for sewer construction and paving. Address Mayor Chapman.

### TELEPHONE SYSTEMS

Ark., Harrisburg.—Southwestern Telephone & Telegraph Co. (main office, Dallas, Tex.) will rebuild telephone system.

Fla., Milton.—C. E. Sudnall has plans by Fulghum & Co., Pensacola, Fla., for telephone office; 40x60 feet; stoves; electric lighting; metal roof; cost \$7000; day labor.

Ga., Columbus.—Southern Bell Telephone & Telegraph Co. (main office, Atlanta, Ga.) awarded contract to erect telephone exchange to Krebs Contracting Co. of Birmingham, Ala.; cost \$125,000.

Md., Denton.—Farmers & Merchants' Telephone & Electric Co., capital stock \$175,000, organized with Harry M. Thompson, president, Hillsboro, Md., and Rev. George S. Ralrigh, vice-president, Denton; consolidates Farmers & Merchants' Telephone Co. and Peninsula Light & Power Co., former operating in Caroline, Queen Anne's and Talbot counties, and latter in Caroline county, furnishing electricity to Denton, Greensboro and Ridgely. Mr. Thompson's offices will be removed from Hillsboro to Denton. (Recently mentioned.)

Okla., Lambert.—Lambert Rural Telephone Co., capital stock \$5000, incorporated by J. A. Eaton, J. C. Bell and J. W. Mercer.

Tenn., Franklin.—Lepers Fork Telephone Co., incorporated by W. D. Fuller, E. T. Johnston, H. H. Davis, P. O. Hassell, W. Southall and W. L. Pinkerton.

Tenn., Nashville.—Southern Telephone & Telegraph Co., capital stock \$10,000, will be incorporated by K. L. Bernard, J. E. Fisher, A. F. Whitman, J. H. Stafford and H. M. Whitman.

Tex., Killeen.—Rural Telephone Co., capital stock \$3000, incorporated by W. H. Walker, H. C. Smith and W. E. Spivey.

Va., Herndon.—Farmers' Telephone & Telegraph Co., capital stock \$5000, incorporated; operate telephone system 100 miles long; William Eads Miller, president; M. T. Wilkins, vice-president; W. M. McNair, secretary-treasurer.

Va., Midland.—Elk Run Telephone Corporation chartered with J. R. Carter, president; D. J. Brown, secretary, both of Midland, and G. M. Taylor of Catlett, Va., vice-president.

### TEXTILE MILLS

Ala., Selma.—Cotton Cloth.—Goodin, Reid & Co., Cincinnati, O., are reported to have purchased Selma Cotton Mills for \$125,000 and as to invest \$75,000 for improvements; plant has 18,000 spindles, 340 looms, etc.

Ga., Chickamauga.—Cotton Cloth.—Crystal Springs Bleachery Co. will issue bonds for \$400,000 and increase capital stock to \$1,000,000; writes to Manufacturers Record: "Building will be 375x131 feet, three stories, of brick construction, with concrete foundations; 20,000 spindles and 700 looms." (Previously noted.)

N. C., Forest City.—Knit Goods.—W. P. Leister (recently reported interested in plan to establish knitting mill) advises from Shelby, N. C.: "There is nothing definite to this report at present."

N. C., Gastonia.—Cotton Yarn.—Ozark Mills will, it is reported, double capacity; now has 10,724 spindles, etc.

N. C., Gastonia.—Cotton Yarn.—Dunn Manufacturing Co. will add 1000 spindles, four

carders and two speeders; has awarded contract; also completed 75x44-foot additional building for cardroom.

N. C., Kinston.—Hosery Yarns.—Caswell Cotton Mills advises relative to recently-noted improvements: Now contemplate erection of 100-foot two-story extension to old building, making capacity of about 14,000 spindles; present equipment 5100 spindles, with order placed for 5400 additional spindles; building material mainly purchased; has power for the additional machinery.

N. C., Lexington.—Cotton Cloth.—Erlanger Cotton Mills (Erlanger Bros., 65 Worth St., New York, and George W. Montcastle of Lexington) awarded contract to Gallivan Building Co., Greenville, S. C., to erect buildings; main structure 68x132 feet, of brick, with concrete floors, costing about \$125,000; tenements costing about \$50,000; will have 25,000 spindles, 680 looms, etc.; steam and electric power; architect-engineer, J. E. Shirrine of Greenville, S. C. (Previously reported organized, etc.)

N. C., Salisbury.—Cotton Yarns.—Vance Cotton Mills will install additional twistors.

S. C., Union.—Cotton Cloth.—Monarch Cotton Mills will build additional mill; wires Manufacturers Record: "Mill building 380x125 feet, four stories and basement, of mill construction; 20,000 spindles and 500 looms decided upon; 55 tenements and one warehouse." Unofficial report states building contract awarded to T. C. Thompson & Bros., Birmingham, Ala., and Charlotte, N. C., and that new buildings and machinery will cost \$500,000.

Tenn., Murfreesboro.—Cotton Goods.—J. C. Beesley is interested in plan to form company to build cotton mill driven by electrical power.

### WATER-POWER DEVELOPMENTS

Ala., Florence.—Major Harry Burgess, United States Engineer, Nashville, Tenn., has, it is reported, issued circular inviting bids on large contracts for dam construction and power utilization on Tennessee River at Muscle Shoals, between Decatur and Florence, Ala.; three dams to be constructed, and each to have power-house; according to specifications, 105,000 horse-power electric current for primary power and 95,000 horse-power of secondary power will be developed; proposals from companies desiring to lease power to be developed at locks are invited; plan is to lease for 100 years.

Ga., Conyers.—Panola Light & Power Co. (recently noted as planning to rebuild power dam on South River, near Conyers, and to install steam plant at Lithonia) advises that total cost of \$200,000 is contemplated; dam 600 feet, 25 feet high, 22-foot base, estimated cost \$25,000; power-house, \$10,000; buildings of stone construction; date of opening bids not set; develop 800 to 1000 horse-power; engineer not employed; application for \$200,000 bond issue heard by Railroad Commission March 26.

### WATER-WORKS

Ala., Aliceville.—Town voted \$11,000 bond issue to construct water-works. Address Town Clerk.

Ala., Girard.—City is considering construction of water-works and electric-light plant; proposes \$45,000 bond issue. Address The Mayor.

Ark., Russellville.—Russellville Water & Light Co. awarded contract to Peter Hugger of Russellville to rebuild dam on Illinois River washed away by high water in January; will require 300 cubic yards concrete.

Ark., Walnut Ridge.—Town contemplates constructing water-works. Address Town Clerk.

Fla., Fort Myers.—City voted \$7000 bond issue for extension of water-works and fire protection. Address The Mayor.

Fla., Tampa.—Tampa Water-works Co. contemplates laying larger mains.

Ga., Gwynn.—City votes April 15 on \$10,000 bond issue for water-works. Address The Mayor.

Ky., Jeffersonstown.—Jefferson county awarded contract to Central Concrete Construction Co. of Louisville at \$3800 to construct reservoir and to J. S. McWilliams of Louisville at \$2875 for heating system at county poor farm near Jeffersonstown. (See "City and County.")

La., Lafayette.—City receives bids until April 9 for supplying and erecting machinery and equipment for recently-noted improvements to water-works and electric-light plant; A. R. Trahan, Mayor; Harold Raymond, engineer, New Orleans, La. (See "Machinery Wanted.")

La., Mansfield.—City Council will meet April 1, when definite plans will be decided

and contract probably let for improvements to water-works and sewerage; also will make plans for street paving; J. M. Rogers, secretary. (Previously noted.)

Miss., Tutwiler.—City water-works construction will include two miles of four, six and eight-inch water pipe, 19 hydrants, 12 gate valves, steel tower and tank, receiving basin, combination gasoline engine and underwriters' fire pump and plain wood building; bids recently noted to be received March 4 were rejected and new bids will be received April 15; plans, etc., with J. L. Donald, clerk; R. C. Huston & Co., Exchange Bldg., Memphis, Tenn., consulting engineers. (See "Machinery Wanted.")

Mo., Maryville.—City will make recently-noted water-works improvements; amount to be expended \$50,000; 500,000 gallons daily capacity; erect small filter-house; extend pump and boiler house; brick construction; date for opening bids not set; install three engines, water-tube boilers, heater, etc.; engineer, Hiram Phillips, St. Louis, Mo.; S. G. Gilliam, secretary Board of Public Works. (See "Machinery Wanted.")

N. C., Mooresville.—City engaged Adlai Osborne, engineer, Charlotte, N. C., for water-works extension and street improvements; bond issue contemplated.

N. C., Winston-Salem.—P. H. Hanes awarded contract to J. B. McCrary Company of Atlanta, Ga., to construct water and sewer main in West Highlands, suburb.

S. C., Camden.—City voted \$125,000 bond issue to construct water-works and electric-light plant; Gilbert C. White, engineer, Charlotte, N. C., recently advised Manufacturers Record that contract to construct water-works had not been awarded pending technicalities in reissuing bonds.

S. C., Due West.—Town will construct water-works; awarded contract for 5000-gallon tank and four-horse-power gasoline engine, etc. Address The Mayor.

S. C., Orangeburg.—City will vote on \$60,000 bond issue to remove and erect water, light and power plant on municipal property adjacent to Edisto River. Address The Mayor.

Tenn., Chattanooga.—City's bill in Legislature, authorizing bonds to buy or build water-works, has been increased to \$2,000,000; bill passed Senate, and awaits action in House. Address The Mayor.

Tenn., Dresden.—City votes April 24 on \$15,000 bond issue for water-works. Address The Mayor. (This supersedes recently-noted election.)

Tenn., Kenton.—City awarded contract to West Tennessee Construction Co. of Memphis, Tenn., to construct water-works; system will include artesian well, power-house, pumps, boilers and auxiliaries, brick pumping station; 2700 feet 8-inch, 8000 feet 6-inch and 1700 feet 4-inch cast-iron water pipe; 32 hydrants, 4 8-inch valves, 15 6-inch valves, steel tank and tower, 100,000 gallon reservoir and all appurtenances; R. C. Huston & Co., consulting engineers, 630 Exchange Bldg., Memphis, Tenn.; M. C. Rossen, Mayor. (Call for bids lately noted.)

Tenn., Tiptonville.—R. C. Huston & Co. of Memphis, Tenn., made surveys from Tiptonville to Reelfoot Lake, two miles, for construction of water-works; build pumping station; city will vote on bond issue.

Tex., Anderson.—Anderson Gin & Water Co., capital stock \$10,000, incorporated by Reld Rikard, W. S. Brown and R. B. Mailard.

Tex., Bronte.—Bronte Water-works Co., capital stock \$16,000, incorporated by W. A. Good, J. B. Reilly and Will Hickman.

Tex., Rosenberg.—City will construct water-works and sewer system to cost about \$30,000. Address The Mayor.

Va., Alexandria.—Alexandria Water Co.'s recently-noted concrete masonry dam for storage reservoir will require 16,000 cubic yards earth and 1600 cubic yards rock excavation, 17,500 cubic yards concrete and 1150 cubic yards rubble masonry; also gate-house, valves, etc.; David J. Howell & Son, engineers, Union Trust Bldg., Washington, D. C., receive bids until April 15. (See "Machinery Wanted.")

W. Va., Anawalt.—Jennette Light & Water Co., capital stock \$10,000, incorporated by R. L. Johnson, A. C. Davis, J. J. Stuart and others.

### WOODWORKING PLANTS

Ala., Mobile.—Veneering.—Central Alabama Veneering Co., capital stock \$10,000, incorporated by S. K. Taylor and M. C. Sherman of Mobile and W. J. Leppert of Camden, Ala.

Ark., Rhytheville.—Staves.—W. W. Cate (vice-president Bank of Jonesboro), Jones-



boro, Ark., and Chicago, Ill., and associates purchased 10-acre site and will build stove plant.

Ark., Blytheville—Cooperage.—Blytheville Cooperage Co., capital stock \$15,000, incorporated by F. P. Carter, T. Slagle and H. L. La Nieve.

Fla., Key West—Boxes.—Key West Box Co. awarded contract to Riley Bros. & Co. to erect addition to box factory; 75x54 feet; solid concrete; also build cistern, 73x54 feet under building, to have capacity of about 100,000 gallons.

Fla., Tampa—Novelties.—H. E. Vote of Denver, Col., and associates will establish novelty woodworking plant.

Ga., Seville—Staves.—Louis Werner Stave Co., Shreveport, La., purchased 6000 acres timber; contemplates erecting plant.

Ga., Summerville—Cooperage.—Jesse Scoggins of Armuchee, Ga., and associates organized company with \$10,000 capital stock to build cooperage in Chaffoga county, probably at Summerville or Gore.

Ky., Middlesboro—Sash and Door, etc.—Blanton & Marshall organized with \$12,000 capital stock; E. W. Blanton, president; J. M. Marshall, Jr., treasurer and manager; will erect building of ordinary construction; manufacture interior finish, special sash and door, store fronts, frames, etc.; plant cost \$5000. (Recently noted.)

N. C., Dunn—Window Shades.—Everlasting Window Shade Co., Angler, N. C., will establish plant to manufacture window shades; daily capacity, 100 dozen; machinery (including band saw, moulding machines, etc.) mainly supplied; open proposals May 1 for erection of \$2500 ordinary construction 100x50-foot building; Dr. C. R. Young, president; J. A. Williams, secretary-treasurer; J. W. Tatum, manager. (See "Machinery Wanted.")

N. C., Wilmington—Shingles, Building Material, etc.—Wilmington Door & Lumber Co. will rebuild plant recently noted burned; will purchase machinery. (See "Machinery Wanted.")

Tex., Aldridge—Boxes, etc.—Aldridge Lumber Co. will establish plant to manufacture packing boxes, crates and shooks; reported to build circular mill with daily capacity of 60,000 feet.

Tex., San Antonio—Sashes and Doors.—Albert and Ernest Steves awarded contract to Jacob H. Wagner to erect sash and door factory; buildings will include planing mill 120x220 feet, warehouse 60x150 feet, boiler-house, drykilns and storage sheds; reinforced concrete; total floor space 100,000 square feet; cost of buildings \$60,000; cost of machinery \$20,000; Leo M. J. Diekmann, architect, prepared plans. (Recently mentioned.)

Va., Charlottesville—Insulator Pins, etc.—L. H. Wiebel, Hagerstown, Md., states is supplied with additional machinery required for building recently noted leased and to be remodeled for manufacturing insulator pins, etc.

#### BURNED

Ala., Sylacauga.—Sylacauga Lumber Co.'s box factory, planing mill and engine-room; estimated loss, \$15,000.

Ark., Lester.—A. E. Gatlin's store and dwelling; loss \$6000.

Ark., Pine Bluff.—Merrill School; loss \$4400. Address The Mayor.

Fla., Lakeland.—J. W. Lanier's residence; loss \$5000 to \$6000.

Fla., Lakeland.—J. W. Lanier's residence; loss \$5000 to \$6000.

Ga., Salem.—Paul D. Kennon's residence; loss \$3500.

Ky., Hickman.—A. F. Barkett's store; loss \$15,000.

Ky., Richmond.—Mrs. E. Tutt Burnam's residence; loss \$7000.

Ky., Junata.—J. T. Jolly's store; loss \$3500.

Ky., Sebree.—Reuben Thomas' residence.

La., Batchelor.—Batchelor Hotel and servants' house.

La., Houma.—F. N. Bourg's residence; loss \$4000.

La., Madisonville.—Theodore Beninger's drykilns, shed and lumber; total estimated loss \$30,000.

La., Meeker.—F. G. Drouett's residence.

La., New Orleans.—Jack McCormick's residence at Ursuline and St. John St.; loss \$15,000 to \$18,000.

La., New Orleans.—Louis Schairer's building, occupied by J. W. Ticker; John Caruso's dwelling, occupied by Robert Lascola; Joseph Faust's residence, occupied by William Delhonne; total loss about \$10,000.

La., St. Joseph.—Tensas Cotton Oil Co.'s plant; estimated loss, \$60,000.

Md., Baltimore.—Union Abattoir Co.'s plant partially destroyed; estimated loss, \$75,000; main office, Brunswick St. and Wilkens Ave.

Md., Reisterstown.—Edgar Heise's residence on Reisterstown Rd., owned by William Russell of Russell & Bro.; loss \$4000.

Md., Cockeysville.—Walter P. Reckord's barn, carriage-house, chicken-house and corn-house; loss \$8000 to \$10,000.

Miss., Jackson.—Mrs. H. H. Harrison's residence; W. W. Simonton's residence, owned by Mrs. D. B. Hutton.

Miss., Jackson.—Eugene Graham's residence damaged; loss \$6000 to \$7000.

Miss., Jackson.—Noble Hotel, owned by George Lemon estate of Jackson and E. B. Noble, proprietor of Rainey Hotel at New Albany, Miss.

Miss., Magnolia.—Building occupied by F. C. Kornrumpf, Magnolia Drug Co., Cumberland Telephone Exchange and others.

Miss., Mississippi City.—Anniston Hotel, owned by Mrs. F. R. Holbrook; loss \$20,000.

Mo., Jacksonville.—M. A. Heister's hardware store; Jacksonville Bank; loss \$25,000.

Mo., St. Louis.—Vidona Bldg., at 8th and Locust Sts. damaged; loss \$6500.

N. C., Oxford.—Oxford Buggy Co.'s plant damaged; estimated loss, \$25,000.

N. C., Statesville.—Imperial Furniture Co.'s boiler-room.

N. C., Wilmington.—Wilmington Handle Co.'s plant; estimated loss \$40,000.

Okla., Madill.—Warehouses of Waters-Pierce Oil Co. (main office, St. Louis, Mo.) and Marsh Milling & Grain Co.; losses, \$4500 and \$5000, respectively.

Okla., Tulsa.—J. C. Randall's residence; loss \$3000.

S. C., Lamar.—E. B. Pierce's store and residence; Colclough Hardware Co.'s building; loss \$3000.

S. C., Walterboro.—M. Carn Fishburne's residence; loss \$4000.

Tenn., Fulton.—James Bate's residence; loss \$3000.

Tenn., Nashville.—City Scavenger Department's stable, W. C. Woodfin, superintendent; loss on building, \$5000.

Tex., Cameron.—Dick Batte's residence; loss \$3000.

Tex., Decatur.—Frazier Furniture Co.'s store.

Tex., Fort Worth.—Henry C. Frazier's residence at 1238 Alston Ave.; loss \$4500.

Tex., Hearne.—Planters' Oil Mill's seed-house; loss \$45,000 to \$50,000.

Tex., Longview.—Dush Shaw's residence; loss \$10,000.

Tex., Mexia.—J. R. Neece Lumber Co.'s office buildings.

Tex., North Zulch.—Bryant & Rogers' warehouse.

Va., Portsmouth.—George T. Perrott's residence at Piedmont Ave. and Nelson St., Prentiss Park.

Va., Radford.—Watts B. Palmer's roller and saw mills.

W. Va., Middleton.—Row of dwellings owned by Consolidation Coal Co., Fairmont.

W. Va., Moundsville.—Tar Run Mining Co.'s coal tippie; estimated loss, \$25,000.

#### DAMAGED BY CYCLONE

Miss., Brookville.—James Barnhill's residence, M. O'Byrne's residence, Phillip Goussett's number of cabins and barn.

## BUILDING NEWS

### BUILDINGS PROPOSED

#### APARTMENT-HOUSES

Ala., Birmingham.—Park Development Co. will erect store and apartment building. (See "Stores.")

Fla., Jacksonville.—H. J. Klutho will erect apartment-house; three stories; brick covered with cement; tin or prepared roofing; built-in gas heaters or vacuum steam heat; entrance lobbies tiled with marble steps and base; tiled bathrooms; indirect lighting in living and dining-rooms; window sash glazed with art glass set in zinc; enameled wainscoting in bathrooms and halls; hand rope elevator; built-in sideboards.

Fla., Tampa.—W. P. Bethen will expend \$4500 to erect apartment-house; mill construction; gas heat; electric lighting; tin roof; plans and construction by owner. (Recently noted.)

Ky., Louisville.—Tobe Greiner, 1003 E. Broadway, will expend \$6000 to erect double apartment-house; 12 rooms; ordinary construction; hot-air heat; metal roof; plans and construction by owner. (Recently noted under "Dwellings.")

Ky., Louisville.—Peter Knopf, Jr., will erect two-story brick-veneer tenement-house at 183-85 Vernon Ave.; cost \$8000.

Ky., Louisville.—O. G. Everbach will erect two-story frame tenement-house at 1623 Elwood Ave.; cost \$6000.

La., New Orleans.—Albert G. Bear, Audubon Bldg. completed plans for apartment-house on St. Andrews St. between Camp and Chestnut Sts.; two stories and basement; pressed brick; terra-cotta trimmings; 12 apartments.

La., New Orleans.—Metropolitan Building Co. will erect Ardley Arms Apartments; four apartments; screened roof garden with flower beds, aviaries and screened sleeping apartments; marble front steps; tile and marble entrance hall; tile floor and marble wainscoting in bathroom; hot-air heat; automatic hot-water supply.

Md., Cumberland.—H. C. Brown, local manager of Bell Telephone Co., and others are promoting erection of \$75,000 apartment-house; 28 apartments and roof garden; four stories; fireproof; construction to begin May 1.

Md., Frederick.—L. E. Mullinix has plans for improvements to building. (See "Stores.")

Mo., Kansas City.—C. H. Lewis will erect brick apartment-house at 3409-11 Tracy St.; cost \$10,000.

Mo., St. Louis.—Vosey Investment Co. will erect three-story apartment-house.

Mo., St. Louis.—E. G. Lay will erect two-story tenement-house at 2335 Red Bud Ave.; cost \$4500.

Mo., St. Louis.—Joseph Habermehl will erect two-story tenement-house at 3564 Utah St.; cost \$4400.

Mo., St. Louis.—Charles Henne will erect two-story tenement-house at 3417 Giles St.; cost \$4000.

Mo., St. Louis.—Henry Luehrmann will erect two-story tenement-house at 3429-31, Ohio St.; cost \$6000.

Mo., St. Louis.—George Bockwinkle will erect two-story tenement-house at 1134 Angelica St.; cost \$4800.

Mo., St. Louis.—Lester Beals will erect two-story tenement-house at 2367 Geraldine St.; cost \$3300.

Mo., St. Louis.—Oscar A. Elmo will erect two three-story tenements and three one-story garages at 5641-47 Waterman St. and four three-story tenements and four one-story garages at 5595-97 Waterman St.; cost \$73,800.

Mo., St. Louis.—W. H. Collins will erect brick apartment-house at 2336 Forest St.; cost \$20,000.

Mo., St. Louis.—John J. Nilligan will erect two-story tenement-house at 3841 Shaw St.; cost \$5000.

Mo., St. Louis.—Estelle K. Smith will erect five and six-room flat on Union Blvd.; cost \$7500.

Mo., St. Louis.—Charles Gietner will erect store and tenement building. (See "Stores.")

Mo., St. Louis.—Higley Bros. will erect three two-story apartment buildings at 4062-68 Arsenal St. and 3112 Oak Hill Ave.; cost \$25,000.

Mo., St. Louis.—J. Charles Mueller will erect two-story tenement-house at 4023 Ashland St.; cost \$4800.

Mo., St. Louis.—Thos. M. Tulley will erect two-story tenement-house at 4057 Maffitt St.; cost \$5000.

Mo., St. Louis.—John U. Menteer will erect two apartment-houses on Nina Pl.; six-room suites; floors of sound-proof cement, covered with hardwood; patent clothes dryers; vacuum cleaning system; sun porch.

Mo., St. Louis.—Mrs. Ethlyn Humphreys will erect apartment-house on McPherson Ave.

Mo., St. Louis.—W. C. Burns, 4539 Gibson Ave., will expend \$6500 to erect tenement-house and store recently noted. (See "Stores.")

Mo., St. Louis.—Fred H. Bohle will erect apartment-house on Fairground Pl.

S. C., Charleston.—Sallie Litschgi will erect apartment-house; cost \$7000.

N. C., Durham.—George W. Watts will erect apartment-house.

N. C., Wilmington.—C. P. B. Mahler will erect apartment-house; two stories; brick; slate roof; 14 rooms; cost \$7000.

Tenn., Nashville.—George Sedberry is having plans prepared by C. K. Colley, Nashville, for apartment-house at Murphy Ave. and 21st St.

Tex., Galveston.—J. D. & J. R. Tabor will erect 14-room flats on Leeland St. between Fannin and San Jacinto Sts.; cost \$3000.

Tex., Houston.—J. Q. and J. R. Taylor will erect apartment-house on Leeland Ave.; 14 rooms; frame and stucco; cost \$9000.

Tex., San Antonio.—Dr. Augustus Maverick is having plans prepared by Ernest P. Behles, San Antonio, for apartment-house; four stories; reinforced concrete; 20 apartments; fireproof; vacuum cleaning system; hot-water; steam heat; telephones; speaking tubes; dumb waiters; garbage burners; tiled floors, corridors and kitchens; marble wainscoting in corridors; cost \$60,000.

Tex., Waco.—Dave Hawtof will erect store and apartment building. (See "Stores.")

Va., Richmond.—D. W. Shreengost, 909 Louisiana St., will expend \$10,000 to erect three tenement-houses; 40x62 feet; ordinary frame construction; tin roof; gas lighting; plans and construction by owner. (Recently noted.)

Va., Richmond.—Virginia Construction Co. will erect two-story brick tenement-house; cost \$5000. (See "Dwellings.")

Va., Richmond.—Davis Brothers and John G. Scott will erect two-story brick tenement-house on Allen Ave.; cost \$32,000.

#### ASSOCIATION AND FRATERNAL

Ark., Benton.—Independent Order of Odd Fellows adopted plans for \$7000 lodge hall.

Fla., Miami.—Fraternal Union Corporation will erect building; not less than three stories; reinforced concrete.

Fla., St. Petersburg.—Women's Town Improvement Association rejected all bids to erect building and will have plans revised and receive new bids; structure to be two stories; probably brick; hot-air heat; electric wiring; gas fixtures; assembly hall 35x33 feet. (Recently noted.)

Miss., Laurel.—Laurel Camp, Woodmen of the World, will erect two-story building.

N. C., Asheville.—Ancient Free and Accepted Masons, it is reported, will erect lodge building; concrete, brick and steel; three and a half stories and basement; cost \$50,000.

Tex., Corsicana.—Young Men's Christian Association, it is reported, will erect building to cost at least \$75,000.

Tex., Hillsboro.—Ancient Free and Accepted Masons are having plans prepared by C. H. Page & Bro., Austin, Tex., for building; two stories; frame; cost \$20,000.

Va., Richmond.—Patrick Henry Council No. 12, Junior Order United American Mechanics, will erect lodge hall; cost \$8000.

Va., Richmond.—Young Women's Christian Association has plans by Noland & Baskerville, Richmond, for building on 5th St.; three stories; concrete and steel; cost \$84,000.

#### BANK AND OFFICE

Ark., Hot Springs.—E. G. Thompson, Little Rock, Ark., has plans for store and office building. (See "Stores.")

Fla., Jacksonville.—Seaboard Air Line Railway Co., W. D. Faucette, chief engineer, Portsmouth, Va., is reported as planning to erect office and union depot building.

Fla., Lakeland.—V. V. Van Huss opens bids about April 10 to erect office and store building. (See "Stores.")

Fla., Miami.—Mrs. Queenia Condon, it is reported, will erect building; five stories; 50x50 feet; lower floor for stores.

Fla., Sarasota.—Bank of Sarasota will erect bank building; J. H. Lord is interested.

Ga., Hartwell.—I. L. & W. E. McCurry will erect building to contain three store-rooms and office. (See "Stores.")

Ky., Louisville.—Whalen Bros. have plans by D. X. Murphy & Bro., 140 S. 5th St., Lou-

isville, to rebuild store and office building recently noted. (See "Stores.")

Md., Frederick.—L. E. Mullinix has plans for improvements to building. (See "Stores.")

Miss., Hattiesburg.—Doherty Operating Co., 60 Wall St., New York, C. Z. Stevens, local manager, will erect office building, etc. (See "Electric Plants.")

Mo., St. Louis.—F. H. Manger, 5720 Von Vusen St., has plans by O. J. King for office and store building; 60x114 feet; mill construction; gravel roof; cost \$30,000; cost of heating plant, \$1200; bids opened. (Recently noted.)

Mo., Wentworth.—Bank of Wentworth, Henry Fehring, is having plans prepared for bank building.

N. C., Carthage.—G. W. McNeill and H. F. Senwell will erect store and office building. (See "Stores.")

N. C., Newbern.—People's Bank has plans by B. H. Stephens, Wilmington, N. C., for bank building; one story; 40 feet high. (Recently noted.)

N. C., Winston-Salem.—Bank organized by J. J. Leight, T. A. Crews and others; is reported as to erect bank building.

Okla., Cherokee.—Farmers' National Bank will erect fireproof bank building to replace burned structure; 25x80 feet; cost \$12,000; plans not made. (Recently noted.)

S. C., Anderson.—Miss Margaret Evans will erect building, ground floor of which will be leased to Chamber of Commerce.

Tenn., Nashville.—Dr. G. C. Savage has plans by Hart & Gardner, Nashville, for office building; four stories; cream-colored brick; stone trimmings; two stores on lower floor; upper floors for offices; fronts of plate glass with Luxfer prism glass and solid copper trimmings; steam heat; passenger elevator.

Tex., Houston.—E. H. Hulsey, Galveston, Tex., is having plans prepared for office, theater and store building to cost \$125,000. (See "Theaters.")

Tex., Richmond.—J. H. P. Davis Bank has plans by C. H. Page & Bro., Austin, Tex., for improvements to front of building; glass and brick; cost \$30,000.

Va., Newport News.—S. W. Holt & Co. will erect store and office building. (See "Stores.")

Va., Richmond.—H. L. Denoon of C. L. & H. L. Denoon will, it is reported, erect 22-story office building at 11th and Main Sts.

Va., Smithfield.—Bank of Smithfield has plans by Herbert L. Cain, Main St. Bank Bldg., Richmond, Va., for bank building to replace burned structure; two stories; stone front; cut-glass dome; marble wainscoting and fixtures; cost about \$10,000; building to be 35x51 feet; steam or hot-water heat; gas and electric lighting; Barrett's specification slag roof; bids opened in about a week; P. D. Gwaltney and F. R. Berryman previously noted to rebuild burned structure occupied by Bank of Smithfield. (See "Machinery Wanted.")

## CHURCHES

Ala., Tuscaloosa.—First Methodist Church, Rev. Marvin R. Hefflin, pastor, will erect church building to cost \$45,000 to \$50,000.

Ark., Hope.—Methodist Church, R. M. Brant, chairman of building committee, opens bids about April 15 to erect building recently noted; 70x80 feet; ordinary construction; hot-air heat; electric lighting; tile roof; cost \$2500; plans by Witt & Seibert Co., Texarkana, Ark. (See "Machinery Wanted.")

Ark., Jonesboro.—First Baptist Church, it is reported, will erect \$60,000 church building. Address The Pastor, First Baptist Church.

Ark., Pine Bluff.—St. Joseph's Catholic Church is reported to have plans by Mitchell Sellman, Pine Bluff, for church building; cost \$50,000.

Fla., Sarasota.—Methodist Church is having plans prepared by Bonfoey & Elliott, Tampa, Fla., for church building; 50x70 feet; brick; 20-foot walls; memorial windows.

Ga., Macon.—Tattnall Square Baptist Church, Robert C. Granberry, member of committee, will expend \$7500 to erect Sunday-school addition; basement, 60x70 feet; heating and lighting already installed; architect not selected. (Recently noted.)

Ky., Benton.—Baptist Church will erect annex to cost \$3500. Address The Pastor, Baptist Church.

Miss., Batesville.—Methodist Church, Rev. J. T. Lockhart, pastor, adopted plans by J. E. Greene, Columbia, Miss., for building; cost \$10,000.

N. C., Carthage.—Presbyterian Church will erect building. Address The Pastor, Presbyterian Church.

N. C., Wake Forest.—Wake Forest Baptist Church, Rev. Walter N. Johnson, pastor, has plans by J. M. McMichael, Charlotte, N. C., for building; 60x60 feet; "L" 40x16 feet; mill construction; steam heat; electric lighting; cost \$40,000; day labor. (Recently noted.)

S. C., Chester.—Purity Presbyterian Church will have plans prepared by Charles M. Robinson, Richmond, Va., for \$20,000 Sunday-school building; will later have plans prepared for church building to replace present structure.

S. C., Kingstree.—Williamsburg Presbyterian congregation will receive bids until April 12 through Louis W. Gilland, chairman of building committee, to erect church building; plans and specifications on file at office of Walker & Burden, architects, 42 Broad St., Charleston, S. C., or may be had on deposit of certified check for \$15.

Tenn., Knoxville.—N. B. White is chairman of building committee to erect People's Tabernacle; two stories; brick; main auditorium and Sunday-school rooms; shower baths, etc.; cost at least \$6000; plans prepared; will award contract about April 15.

Tenn., Memphis.—Collins Chapel plans to repair burned structure at cost of about \$5000. Address The Pastor, Collins Chapel.

Tex., Dallas.—Temple Emanuel-El Congregation, J. K. Hexter, president, will erect synagogue.

Tex., Dallas.—Methodist Church, Prather and Commerce Sts., will erect church building; cost about \$100,000. Address The Pastor, Methodist Church.

Tex., Rockdale.—Presbyterian congregation has plans for church building. Address The Pastor, Presbyterian Church.

Tex., Orange.—First Baptist Church, Rev. J. S. Pearce, pastor, will erect church building; cost \$25,000.

Tex., Orange.—Methodist Episcopal Church South, Rev. Ira Bryce, pastor, will expend \$25,000 to erect building recently noted; fireproof; steam or hot-air heat; electric lighting; slate roof; plans not made; architect not selected. (See "Machinery Wanted.")

Va., Heathsville.—Corinth Methodist Episcopal Church, Rev. J. Elmer Hearn, pastor, has plans by J. D. Hosier, Covington, Va., for building recently noted; 30x48 feet, with Sunday-school room 12x30 feet; mill construction; tin roof; cost \$2500. (See "Machinery Wanted.")

Va., Newport News.—Second Baptist Church has plans by C. T. Holtzclaw, Hampton, Va., for addition to Sunday-school building; 25x52 feet; ordinary construction; slate roof; cost \$7500 to \$9000. (Recently noted.)

W. Va., Elkins.—Baptist church, Rev. H. W. Tiffany, pastor, has plans by Edwin E. Pruitt & Co. for church building.

## CITY AND COUNTY

Fla., West Tampa, Station Tampa.—Library.—City will erect Carnegie Library; cost \$17,500. Address The Mayor.

Ky., Louisville.—Library.—Louisville Free Public Library, George T. Settle, librarian, will soon open bids to erect Eastern Colored Branch Library; 60x80 feet; fireproof; hot-water; tile roof; cost \$17,500; plans by Fred Erhart, Fourth Ave. and Jefferson St., Louisville. (Recently noted.)

Miss., Charleston.—Jail.—Tallahatchie county will let contract May 5 to erect jail; brick; reinforced concrete construction; composition roof; to contain living-rooms for jailer, five tool-proof cells and four Bessemer cells; cost \$11,000; plans and specifications obtainable from Overstreet & Spencer, architects, Seutter Bldg., Jackson, Miss., on deposit of \$20. (Previously noted.)

Mo., Kansas City.—Hospital.—C. Myrand, secretary, Hospital and Health Board, states hospital (recently noted to be erected) is completed.

Mo., St. Louis.—Jail.—Board of Public Improvements, Maxime Reber, president, will erect proposed city jail to cost \$312,000; steel cells to accommodate 351 prisoners; five stories.

N. C., Greensboro.—Opera House.—City Commissioners will receive bids until April 9 to remodel Grand Opera House; plans and specifications at office of T. J. Murphy, Mayor. (Previously noted.)

Okla., Bartlesville.—Jail, etc.—J. C. Mitchell, County Clerk, opens bids April 9 to erect courthouse and jail recently noted. (See "Courthouses.")

Okla., Tulsa.—Convention Hall.—City will

receive bids until April 8 for convention hall; reinforced concrete and steel; fireproof; brick walls; concrete floors, arena portion covered with hard maple flooring; electric lights; maximum size, 190x140 feet; minimum size, 75x140 feet; inclined passageways; steam heat; seating capacity approximately 5000; cost about \$96,000.

S. C., Camden.—Hospital.—Building committee of Camden Hospital will receive bids at office of W. M. Shannon until March 31 to erect hospital buildings; plans and specifications from James B. Urquhart, architect, J. Carroll Johnson, associate, 707 National Loan and Exchange Bank Bldg., Columbia, S. C. (Previously noted.)

S. C., Columbia.—Jail.—Richland county will vote April 1 on \$30,000 bond issue to erect jail. Address County Commissioners.

Tenn., Nashville.—Stable.—Board of Public Works, George W. Stainback, chairman, will rebuild stable reported burned at loss of \$5000.

Tex., Dallas.—Jail.—Dallas county has plans by H. A. Overbeck, Dallas, for jail; seven or eight stories; about 100x100 feet; forced air ventilating, heating and cooling system; reinforced concrete and steel construction; will contain rooms for two Criminal District Courts, probably two Justice Courts and Sheriff's offices; accommodations for 300 prisoners; kitchen and laundry on top floor; cost about \$200,000. (Previously noted.)

## COURTHOUSES

Ala., Birmingham.—Jefferson County Commissioners will receive bids until April 1 to erect wing to courthouse; plans by H. B. Wheelock, Birmingham. (Previously noted.)

Ala., Birmingham.—Board of Revenue of Jefferson County will receive bids until April 5 to erect addition to courthouse; plans and specifications at office of Harry B. Wheelock, Steiner Bank Bldg., Birmingham. (Previously noted.)

Fla., Madison.—Madison County Commissioners have plans by Bishop & Greer, Candler Bldg., Valdosta, Ga., for courthouse; reinforced concrete semi-fireproof construction; steel trusses; exterior walls pressed brick; limestone trimmings; tile roof; steam heat; tile floors in corridors, with marble wainscoting; cost \$50,000. (Recently noted.)

Mo., Galena.—Stone county will vote March 29 on \$25,000 bond issue to erect courthouse. Address County Commissioners.

Okla., Bartlesville.—J. C. Mitchell, County Clerk, opens bids April 9 to erect courthouse and jail. (Recently noted as rejecting all bids to erect building.)

Tex., Palestine.—Anderson County Commissioners have plans by C. H. Page & Bro., Austin and Houston, Tex., for courthouse; three stories and basement; fireproof; dome; 138x182 feet; 36,000 feet floor space; Bedford stone steps 43 feet wide; 32 Bedford stone columns; four entrances; tile floors; marble wainscoting; yard enclosed with concrete balustrade; concrete walls approaching building from four sides; reinforced concrete, hollow tile and terra-cotta. (Recently noted.)

## DWELLINGS

Ala., Birmingham.—A. O. Landsay will erect two-story brick veneer dwelling; cost \$3000.

Ala., Birmingham.—House Building Co. will erect two two-story frame dwellings on Fifteenth Ave.; cost \$4000.

Ala., Gadsden.—J. T. Phillips will erect residence.

Ala., Gadsden.—S. C. McDaniel opens bids August 1 to erect residence recently noted; 10 or 12 rooms; character of construction not decided. (See "Machinery Wanted.")

Ark., Little Rock.—D. H. Norwood will erect two-story residence; cost \$600.

Fla., Jacksonville.—T. H. Minor will erect two-story frame dwelling; cost \$4900.

Fla., Jacksonville.—Fred Bettelini will erect four one-story frame dwellings on Myrtle Ave.; cost \$3400.

Fla., Jacksonville.—J. W. Hill will erect two two-story frame dwellings on 8th St. between Perry St. and Boulevard; cost \$6000.

Fla., Lakeland.—J. R. Talley will erect residence 35x42 feet; frame; stucco; tin shingle roof; cost \$2500; plans and construction by owner. (Recently noted.)

Fla., Miami.—Courtland Van Camp, president Van Camp Hardware & Iron Co., will erect residence to cost about \$10,000.

Fla., Miami.—J. Q. Van Winkle, general manager of Cleveland, Cincinnati, Chicago & St. Louis Railway, Cincinnati, O., will, it is reported, erect \$10,000 residence.

Fla., Miami.—Mrs. I. A. Watkins, local representative of New York Herald, it is reported, will erect winter residence.

Fla., Palmetto.—J. A. Lamb will erect residence.

Ga., Atlanta.—Hillin-Morris Company will erect 10 dwellings on West Ontario St.

Ga., Atlanta.—J. M. Maddox will erect two-story frame dwelling on Howell Mill Rd.; day labor; cost \$5000.

Ga., Atlanta.—G. W. Chamlee will erect two-story dwelling at 132 Crew St.; day labor; cost \$3000.

Ga., Atlanta.—R. C. Darby, 127 Central Ave., will expend \$8000 to erect two-story 40x100-foot store and dwelling and one-story 40x100-foot dwelling; ordinary brick and frame construction; rubberoid roof; plans by C. E. Frazier, Candler Bldg., Atlanta; day labor. (Recently noted.)

Ga., Atlanta.—H. T. Whitten will erect two-story frame dwelling at 3 Westwood St.; cost \$3500; day labor.

Ga., Comer.—W. E. Henslee, cashier of Comer Bank, will erect residence.

Ga., Lagrange.—H. C. Ashe will erect dwelling.

Ga., Lagrange.—S. Y. Austin will erect dwelling.

Ga., Lagrange.—Judson Milan will erect residence; cost \$3000.

Ga., Lagrange.—Dixie Mills will erect 40 tenant cottages.

Ky., Louisville.—O. J. Bader will erect brick dwelling at 178 Vernon Ave.; cost \$5000.

Ky., Louisville.—Louis Herfel will erect brick-veneer bungalow to cost \$7500.

Ky., Louisville.—E. L. Tharp will erect two frame cottages at 1229-31 Dunesnell St.; cost \$3000.

Ky., Louisville.—W. B. Morgan will erect two frame dwellings at 653-57 S. 34th St.; cost \$3000 each.

Ky., Louisville.—J. L. Rodman will erect brick dwelling at 2016 Date St.; cost \$3000.

Ky., Louisville.—F. M. Perkins will erect brick-veneer dwelling at 189 Vernon Ave.; cost \$5000.

Ky., Louisville.—E. S. Boswell will erect two brick dwellings at 2212-14 Baringer Ave.; cost \$10,500.

Ky., Winchester.—John Hardwick will erect residence.

Ky., Louisville.—J. E. Grant will erect frame dwelling at 652 S. 34th St.; cost \$3500.

Ky., Paducah.—E. D. Taylor has plans by A. L. Lassiter & Bro., Paducah, for dwelling; steam or hot-water heat; cost \$4000.

La., New Orleans.—Miss O. Koppel and George Koppel will erect two double two-story residences; cost \$9538.

La., New Orleans.—Leo Feldsman will erect two-story frame residence; cost \$3900.

La., New Orleans.—L. D. Solosky will erect two double cottages on Laurel St.; cost \$4000.

La., New Orleans.—Union Homestead will erect double cottage; cost \$4100.

La., New Orleans.—Crescent City Homestead will erect double cottage; cost \$3000.

La., New Orleans.—Mrs. F. Bohn will erect two-story residence.

La., New Orleans.—Gentilly Terrace Co. will erect bungalow on Music St.

La., New Orleans.—L. W. Morgan will erect two-story residence on Miro St.

La., New Orleans.—Consolidated Realty & Manufacturing Co. will erect six bungalows at Calhoun and Freret Sts., Jeanette, Adams, Banks St. and Lakeview.

Md., Baltimore.—Henry J. Tinley, 312 N. Charles St., is preparing plans for two cottages at Cleona Park; two and a half stories; shingle and weatherboard; stone foundation.

Md., Baltimore.—George A. Cook, 2900 Guilford Ave., will expend \$70,000 to erect 25 dwellings; 16x34 feet; ordinary construction; slag roof; plans by William B. Gerwig, 1028 N. Fulton Ave., Baltimore; construction by owner. (Recently noted.)

Md., Baltimore.—Ell Oppenheim, 112 W. Fayette St., has plans by Louis Carter Baker, 31 S. 17th St., Philadelphia, Pa., for residence on Lake Drive near Linden Ave.; three stories; brick and stone; cost about \$50,000; contractors estimating are Willard E. Harn Company, 213 N. Calvert St.; Fred Decker & Son, 1209 E. Biddle St.; Morrow Bros., Fidelity Bldg.; Thomas B. Standfield & Co., 109 Clay St.; L. O. Hildebrand & Bro., 215 Courtland St.; McLaughlin Bros., 915 Bolton St., all of Baltimore; J. P. Thorpe



son and Metzger & Wells; bids due March 30. (Previously noted.)

Md., Frederick.—Clarence Malone is having plans prepared by R. Evar Kepner, Frederick, for bungalow; eight rooms and bath; hollow tile and stucco.

Mississippi.—Dr. Wallace Carnahan will expend \$4000 to erect residence; plans by Overstreet & Spencer, Seutter Bldg., Jackson. (Previously noted.)

Miss., Jackson.—Oscar Newton, Jr., has plans by Overstreet & Spencer, Seutter Bldg., Jackson, for dwelling; brick veneered and half-timbered stucco; shingle roof; hot-water heat; cost \$10,000.

Miss., Lexington.—Paul H. Murphy has plans by Overstreet & Spencer, Seutter Bldg., Jackson, for dwelling; cost \$3000.

Mo., Kansas City.—Philip T. Drotts will erect frame dwelling at 234 W. 63d St.; cost \$3000.

Mo., Kansas City.—D. F. Clawges will erect stucco dwelling at 6009 Central St.; cost \$4000.

Mo., Kansas City.—L. L. Hannah will erect stucco dwelling at 3333 Bellefontaine St.; cost \$3000.

Mo., Kansas City.—Daniel Stosberg will erect four frame dwellings on Agnes St.; cost \$6000.

Mo., Kansas City.—H. E. Wight will erect one stucco and one frame dwelling at 3844 and 3842 Park St.; cost \$4200.

Mo., Kansas City.—Allen C. Smith, 3410 E. 12 St., will erect six-room residence; ordinary construction; steam or hot-air heat; shingle roof; cost (including heating plant) \$4000; architect not selected. (Recently noted.)

Mo., St. Louis.—Boster Construction Co. will erect three stucco dwellings in 560 block College St.; cost \$6000.

Mo., St. Louis.—A. U. Hart will erect five one-story dwellings in 4400 block of Lee St.; cost \$10,000.

Mo., St. Louis.—George W. Mitchell will expend \$4000 each to erect two dwellings 25x33 feet and one dwelling 26x39 feet; ordinary construction; hot-water heat; slate or tile roof; plans and construction by owner. (Recently noted.)

Mo., St. Louis.—F. J. Kalbfeld will erect two one-story dwellings at 2374-76 E. Union St.; cost \$4000.

Mo., St. Louis.—W. A. Reed will erect two one-story dwellings at 2228-30 Era St.; cost \$5000.

Mo., St. Louis.—Joseph Maher, Jr., will erect four one-story dwellings at 4516 18 Natural Bridge St.; cost \$8000.

Mo., St. Louis.—Charles Maguire will erect two-story dwelling at 5938 DeGillville St.; cost \$4000.

Mo., St. Louis.—Charles H. Greene, Jr., will erect residence in Washington Heights.

Mo., St. Louis.—Edward Mallinckrodt, Jr., is having plans prepared by James P. Jamieson, St. Louis, for residence on Westmoreland Pl.

Mo., St. Louis.—Joseph E. Barroll, vice-president and general manager Butler Bros., will erect residence in West Brentmoor.

Mo., St. Louis.—W. J. Hurt will erect two-story dwelling at 4415 Taft St.; cost \$3400.

Mo., St. Louis.—Warren Goddard, president of Goddard Grocery Co., will erect residence in West Brentmoor.

Mo., St. Louis.—Mrs. M. K. McClintock will erect \$7000 residence.

Mo., St. Louis.—Charles Stickel will erect three-story dwelling at 2516 Russell St.; cost \$9000.

Mo., St. Louis.—Lisetta Real Estate & Investment Co. acquired site 50x125 feet and will erect dwellings.

Mo., St. Louis.—Anheuser-Busch Company will erect two-story dwelling at 301 De Balliviere St.; cost \$10,000.

Mo., St. Louis.—Harry B. White will erect two one-story dwellings at 5233 and 5229 Louisiana; cost \$3500.

Mo., St. Louis.—Anton Degenhardt will erect two-story dwelling at 3856 Meremac St.; cost \$3400.

N. C., Canton.—L. A. Westmoreland will rebuild residence; 10 rooms; character of roofing not determined. (Recently reported burned.)

N. C., Carthage.—E. C. Fry will erect two-story residence.

N. C., Raleigh.—Charles V. York will erect six dwellings in Boylan Heights.

N. C., Statesville.—J. G. Powell will erect residence; two stories; nine rooms; cost \$4000.

Okla., Tulsa.—Frank Horton will erect

two-story frame dwelling on Carson St.; cost \$4000.

Okla., Tulsa.—C. D. Cooshall will erect two-story frame dwelling on Elwood Ave.; cost \$3000.

Okla., Tulsa.—S. M. McBirney will erect one-story dwelling on Denver St.; cost \$5000.

S. C., Greenville.—Mrs. W. F. Robertson will erect residence on McDaniel Ave.; cost \$3500.

Tenn., Nashville.—C. D. Crockett has plans by Waller & Hinz for dwelling; 32x36 feet; brick; ordinary construction; slate roof; cost \$5000; cost of heating plant \$225; contracts let separately.

Tenn., Nashville.—Frank C. Guthrie has plans by Asmus & Norton, Nashville, for residence; Italian renaissance; colonnade porch; red brick and stone; tile roof; hot-water heat; hardwood floors; laundry in basement.

Tenn., Nashville.—Frank S. Washburn has plans by Dean & Dean, Chicago, Ill., for residence; two stories; 108x64 feet; California style; stone veneer and stucco; C. C. Motz, supervising architect, Nashville.

Tex., Austin.—Van Smith is having plans prepared by C. H. Page & Bro., Austin, for six-room frame dwelling; cost \$6000.

Tex., Austin.—Sidney Posey is having plans prepared by C. H. Page & Bro., Austin, for five-room bungalow.

Tex., Dallas.—S. A. Lynch will erect two two-story nine-room frame cottages at 205 and 315 Rosemont St.; cost \$6000.

Tex., Dallas.—J. A. Traylor will erect two-story eight-room frame residence at 221 S. Edgefield St.; cost \$3500.

Tex., Dallas.—G. R. Holloway will erect two-story eight-room frame residence at 5319 Ross St.; cost \$4300.

Tex., Dallas.—Dallas Co-operative Land Co. will erect four five-room frame cottages in 5600 block Junius St.; cost \$6000.

Tex., Dallas.—William Dentbridge will erect two-story nine-room frame dwelling at 4523 Reiger St.; cost \$4000.

Tex., Dallas.—Mrs. M. G. Morton will erect two-story frame seven-room residence at 3831 Gilbert St.; cost \$3000.

Tex., El Paso.—Hawkins Bros. will expend \$26,000 to erect 26 four and five-room cottages; construction by owner. (Recently noted.)

Tex., Houston.—William A. Wilson Company will erect seven five-room, two seven-room, two six-room and two eight-room dwellings on Rusk, Polk and Euclid Ave.; cost \$21,650.

Tex., Houston.—F. J. Marett will erect seven-room residence in Montrose Addition and eight-room residence at Aerial and Hathaway Sts.; cost \$12,500.

Tex., Lake Creek.—Methodist Episcopal Church will erect parsonage. Address The Pastor, Methodist Episcopal Church.

Tex., Pleasanton.—Mrs. Martha A. Smith will erect two cottages.

Tex., Pleasanton.—John W. Hunt will erect dwelling.

Tex., San Antonio.—Jerome Arnold will erect two-story dwelling on Richmond Ave.; cost \$3000.

Va., Alexandria.—H. P. Wilson of New York purchased Hollin Hall farm, consisting of 300 acres, and Mt. Hybla farm, containing 53 acres, near Alexandria, and will erect residence; Frank Van Sant, Southern Bldg., Washington, D. C., attorney for Mr. Wilson.

Tex., Victoria.—Harry G. Woodhouse will erect two cottages.

Va., Lynchburg.—R. T. Watts, Jr., will erect residence.

Va., Richmond.—R. Francione and G. W. Jackson will erect store and dwelling. (See "Stores.")

Va., Richmond.—Davis Bros., Inc., will erect four detached two-story brick dwellings on Elm St. between Main and Cary Sts.; cost \$12,000.

Va., Richmond.—Virginia Construction Co. will erect two-story brick dwelling on Court St. to cost \$2000 and two-story brick tenement-house to cost \$5000.

Va., Richmond.—Mrs. Lucy F. Murray will erect two semi-detached brick dwellings; cost \$10,500.

Va., Richmond.—Harvey C. Brown will erect two detached brick dwellings at 2227-29 Monument Ave.; cost \$20,000.

Va., Waynesboro.—H. M. Magle, First National Bank Bldg., may be addressed relative to erection of brick residence; cost \$6500; bids opened. (See "Machinery Wanted.")

W. Va., Wheeling.—J. B. Sommerville will erect fireproof dwelling.

## GOVERNMENT AND STATE

Ga., Augusta—Postoffice.—Treasury Department, Oscar Wenderoth, supervising architect, Washington, D. C., rejected all bids to erect postoffice building. (Recently noted.)

La., Jackson—Asylum.—Board of East Louisiana Hospital for Insane has plans by Favrot & Livaudais, New Orleans, for two buildings; two stories; reinforced concrete. (Previously noted.)

Mo., Jefferson City—Capitol.—State Capitol Commission, E. W. Stephens, chairman, will award contract April 21 for foundation for \$3,500,000 State Capitol building. (Previously noted.)

Okla., Enid—Institution.—Legislature appropriated \$50,000 to erect buildings for Institute for Feeble-Minded; Lee Cruce, Governor, Guthrie, Okla.

Okla., Oklahoma City—Capitol.—Legislature passed resolution accepting 650-acre tract and \$100,000 cash bonus for erection of proposed Capitol building.

## HOTELS

Fla., Jacksonville.—Hall, Holt & Anderson will erect hotel on State St.; three stories; brick; metal fire stairs on front and rear porches; airshafts lined with asbestos plaster board.

Fla., Key West.—J. A. Willis, T. W. White and others are promoting erection of hotel to cost \$100,000.

Fla., Sarasota.—J. H. Lord will erect combined hotel and business block; frontage of 250 feet on Main St.

Fla., St. Petersburg.—Detroit Hotel, C. N. Crawford, manager, accepted plans by Bonfoey & Elliott, Tampa, for addition to hotel; four stories; 60 rooms and 35 bathrooms; 42x160 feet; elevator; brick construction; fireproof; four stores on first floor; cost \$90,000. (Recently noted.)

Ky., Louisville.—Preston Hotel Co. has plans by D. X. Murphy & Bro., Louisville, to remodel building at 103-109 S. 3d St.; cost \$8500.

La., Plaquemine.—Silbers Central House Co., it is reported, will erect hotel; three stories; brick.

Miss., Mississippi City.—Mrs. F. R. Holbrook will rebuild Anniston Hotel, reported burned at loss of \$20,000.

N. C., Cape Lookout (not a postoffice).—Lookout Land & Improvement Co., American National Bank Bldg., Richmond, Va., will erect hotel; Chas. K. Howe of Beaufort, N. C., secretary-treasurer, is engineer in charge. (See "Land Developments.")

N. C., North Wilkesboro.—Gordon Hotel Co., incorporated with \$125,000 capital stock by J. R. Finley, S. W. Tomlinson and others.

Tenn., Lexington.—G. H. Daws, proprietor of Scott House, will erect hotel to replace present structure; brick; 40 rooms; offices, dining room, etc.

Tex., Beeville.—Young Men's Progressive League is interested in organization of company to erect hotel.

Tex., Austin.—C. Pitts, H. E. Ford, C. O. Smith and associates will erect hotel; Messrs. Pitts, Ford and Smith wire the Manufacturers Record: "Hotel will be 10 stories; 92x128 feet; steel frame; concrete floor; walls of brick; terra-cotta and stone trimmings; 225 bedrooms with baths and roof garden; cost about \$500,000; architect, Roy L. Thomas, Scarborough Bldg., Austin." Also reported to erect \$200,000 theater.

Tex., Greenville.—W. L. Beckman will erect hotel.

Tex., Greenville.—United Commercial Travelers, Council No. 271, will erect hotel; six stories; 75x90 feet; fireproof construction; cost \$150,000; architect not selected. (Previously noted.)

Va., Coeburn.—John L. Litz will erect four-story hotel.

Va., Petersburg.—Chamber of Commerce and Retail Merchants' Association (H. W. Wilcox, president) are promoting erection of hotel; tentatively contemplate erection of structure on site of new Shirley, with 100 rooms; cost \$100,000. (Recently noted.)

Va., Richmond.—E. A. Stumpf has plans for annex to Stumpf Hotel; probably eight stories; steel frame; fireproof; about same size as present structure; 60 rooms.

## MISCELLANEOUS

Ky., Dawson Springs.—Hall.—H. G. O'Kain has plans for convention hall, etc. (See "Theaters.")

Ky., Louisville.—Association.—Young Men's

Hebrew Association will erect building. L. S. Bernheim, Dr. H. E. Mechlin and others are interested.

Ky., Paducah—Clubhouse.—Paducah Golf and Country Club will erect clubhouse, golf links and tennis courts.

Md., Baltimore—Hospital.—Church Home and Infirmary, Broadway and Fairmount Ave., has plans by Wyatt & Nolting, Keyser Bldg., Baltimore, for improvements, including alterations to entrance, etc.; cost about \$3000. (Previously noted.)

N. C., Oxford—Parish-house.—St. Stephens Episcopal Church will erect parish building to cost \$5000.

S. C., Spartanburg—Hospital.—Dr. B. B. Steedly is reported organizing company to erect surgical hospital; cost \$65,000.

Tenn., Chattanooga—Auditorium.—Mountain Land Co. will erect auditorium on Signal Mountain recently reported to be erected by C. E. James; building 66x100 feet; steel construction; fireproof roof; cost \$10,000; plans by Adams & Alsop, Chattanooga; will erect by force account.

Tenn., Knoxville—Pavilion.—National Conservation Exposition Co., T. A. Wright, president, will erect dining hall and dancing pavilion about 100x100 feet.

Tenn., Memphis—Hospital.—Methodist Hospital, Rev. H. M. Ellis, field secretary, will erect hospital; ultimate cost, \$500,000; will erect one section first at cost of \$150,000, while remainder of fund is being raised; fireproof construction; J. H. Sherard, chairman of executive committee, has been authorized to employ architects to prepare plans. (Previously noted.)

## RAILWAY STATIONS, SHEDS, ETC.

Ala., Demopolis.—Southern Railway Co., R. Herman, chief engineer, 1300 Pennsylvania Ave., Washington, D. C., will erect freight depot.

Ark., Batesville.—St. Louis, Iron Mountain & Southern Railroad, J. R. Stephens, chief engineer, St. Louis, Mo., will erect proposed station; stone and marble; cost about \$50,000.

Fla., Jacksonville.—Seaboard Air Line Railway Co., W. D. Faucette, chief engineer, Portsmouth, Va., is reported as planning to erect union depot and office building.

Ky., Earlinton.—Louisville & Nashville Railroad, W. H. Courtenay, chief engineer, Louisville, Ky., will expend \$50,000 for improvements, including removal of depot 300 feet south, erection of train shed 300 feet long, construction of sidewalk 400 feet long and installation of steam heat and running water in depot.

Ky., Fulton.—Illinois Central Railroad Co., A. S. Baldwin, chief engineer, Chicago, Ill., will erect depot; pressed brick; Bedford stone trimming; concrete platform; iron sheds.

Md., Baltimore.—Pennsylvania Railroad, A. C. Shand, chief engineer, Philadelphia, Pa., contemplates enlargement of depot and warehouse facilities at Calvert Station, construction of streets and crossings, bridges, etc.; detail plans will be determined in future conferences with city officials; will probably outline extensive plans.

Md., Baltimore.—Western Maryland Railway Co., H. R. Pratt, chief engineer, Hillen Station, Baltimore, it is reported, commissioned Emory & Nussner, Professional Bldg., Baltimore, to prepare plans for depot improvements to cost about \$30,000; improvements to include erection of addition, remodeling present structure, construction of shed and concourse, redecorating, installing sanitary plumbing equipment, etc.; following contractors are reported estimating: John Hiltz & Sons, 3 Clay St.; Consolidated Engineering Co., Bromo-Seltzer Tower Bldg.; J. J. Walsh & Sons, 1533 Maryland Ave.; J. Henry Miller, Inc., 108 Dover St.; Cowan Building Co., 106 W. Madison St.; D. M. Andrew Company, Mt. Vernon Ave. and 28th Sts.; all of Baltimore.

N. C., Canton.—Tennessee & North Carolina Railroad, H. F. Holt, chief engineer, Newport, Tenn., and Southern Railway Co., B. Herman, chief engineer, 1300 Pennsylvania Ave. N. W., Washington, D. C., will erect station.

S. C., Greenville.—Southern Railway Co., B. Herman, chief engineer, 1300 Pennsylvania Ave. N. W., Washington, D. C., will erect addition to freight depot 30x150 feet.

## SCHOOLS

Ala., Fort Payne.—City will probably issue \$10,000 of bonds to erect school. Address The Mayor.

Ala., Tuscaloosa.—City will expend \$6000 to erect grammar school; four rooms

and basement; hot-air heat; pitch and gravel roof; plans by W. E. Bennis, Bessemer, Ala. (Recently noted to open bids April 2.)

Fla., Tampa.—Buffalo Avenue Trustees will receive bids through Marshall Moore, superintendent of public instruction of Hillsborough county, until March 28 to erect two-story brick school; plans and specifications at office of Willis R. Biggers, architect, Franklin Square Bldg., Tampa.

Ga., Albany.—City is considering election to vote on \$75,000 bond issue to erect two grammar school buildings; I. J. Hofmayer, chairman of committee.

Ga., Collegepark.—Fulton County Board of Education, Atlanta, Ga., is having plans prepared by Carlton & Wolsenroft, La Grange, Ga., for high school; two stories; brick; six rooms, auditorium, cloakroom, etc.

Ga., Decatur.—Board of Education, H. Howell Green, chairman, will receive bids until March 25 to erect school; plans and specifications at office of Morris & Morris, architects, Atlanta National Bank Bldg., Atlanta, Ga.

Ga., Macon.—Board of Education selected Blair & Adams, Macon, to prepare plans for high school; ordinary construction; mechanical steam heat; electric light; cost \$100,000. (Previously noted.)

Ga., St. Mary's.—City will erect school building; metal roof; cost \$7000; plans not made; J. T. Hughes, Clerk. (Bond issue recently noted voted.)

Ky., Hazard.—County Board of Education and Trustees of Hazard Graded School will erect school.

Ky., Lexington.—Board of Education is considering expenditure of \$15,000 to install heating plants and improve sanitary equipment in Johnson and Dudley schools.

Md., Baltimore.—Bids received until March 27 to erect Gilman Hall building for Johns Hopkins University at Homewood according to plans by Parker, Thomas & Rice, Union Trust Bldg., Baltimore; contractors estimating are J. Henry Miller, Inc., 108 Dover St.; John Waters, 23 E. Center St.; Edward Brady & Sons, 1113 Cathedral St.; John Hiltz & Sons, 7 Clay St.; George A. Fuller Company, Munsey Bldg., and Norcross Bros. Company, Colorado Bldg., both of Washington, D. C. (Previously noted.)

Miss., Meridian.—Rev. W. Ten Brink, 2614 Davis St., will receive bids until April 1 to erect school; plans and specifications at office of P. J. Krouse, architect, Meridian. (Previously noted.)

Miss., Woodville.—Wilkinson county will let contract about April 15 to erect Agricultural High School building; two structures; brick; cost \$30,000; plans by Overstreet & Spencer, Scatter Bldg., Jackson, Miss. (Previously noted.)

Mo., Rosedale.—Rosedale school district will vote April 1 on \$28,000 bond issue to erect high school. Address District School Trustees.

Mo., St. Louis.—City purchased 369-acre tract in St. Louis county as site for proposed industrial school.

N. C., Greensboro.—Greensboro College for Women, Rev. S. B. Turrentine, president, will erect additional dormitory.

N. C., Newbern.—Trustees of Craven county's proposed Farm Life School accepted plans by F. K. Thompson, State Architect, for main building, dormitory and principal's residence; will receive bids until April 19, as follows: (1) For each building separately; (2) for bungalow and dormitory; (3) for dormitory and school; (4) for buildings as a whole; plans may be had on application to S. M. Brinson, secretary of trustees.

N. C., Wilson.—Board of Trustees Wilson Graded School District, George Hackney (not John F. Bruton, as recently noted), chairman, will soon hold election on \$30,000 school bond issue.

N. C., Hamlet.—Town Commissioners will remodel graded school building and provide four additional rooms; cost \$10,000.

Okla., Hennessee.—City is having plans prepared for \$25,000 school; bond issue voted. Address The Mayor.

S. C., Greenwood.—Bailey Military Institute will award contract March 28 to erect building; three stories; 200x40 feet; brick-veneer; electric lights; steam heat; cost \$30,000; plans by J. H. Casey and S. N. Jance, associate architects, Greenwood. (Recently noted.)

Tenn., Columbia.—Board of Education, W. C. Salmon, president, will erect high school; R. L. Harris, chairman of committee on plans and specifications.

Tenn., Jefferson City.—Carson and Newman

College trustees have plans for \$10,000 gymnasium.

Tex., Angleton.—Angleton School District will vote April 15 on \$15,000 bond issue to erect school. Address District School Trustees.

Tex., Indian Gap.—School Trustees will receive bids until March 29 to erect two-story school; plans and specifications on deposit of \$10 from E. E. Yarbrough, secretary of board.

Tex., Mineola.—City will erect high school building; hot water or steam heat; cost \$13,000; architect not selected; P. E. Wallace may be addressed. (Bond issue recently noted.)

Tex., Nordheim.—City opens bids April 1 to erect school building; 58x80 feet; brick; air-draft stoves; composition gravel roof; cost \$14,000; plans by J. Henry Yentzen; proposals may be addressed to L. C. Nentzler. (Recently noted.)

Va., Lexington.—Washington and Lee University has plans by B. C. Flournoy, 701 Withers Bldg., Washington, D. C., for gymnasium; cost \$75,000; date of opening bids not determined. (Recently noted.)

Va., Richmond.—City School Board will erect proposed Springfield Public School.

Va., Richmond.—City has plans by Carneal & Johnston, Richmond, for Springfield School; 23 rooms; fireproof; brick and reinforced concrete; heating and ventilating systems; open-air roof and playground; accommodations for 600 pupils; has \$85,000 appropriation.

Va., Salem.—Alumni Association of Roanoke College has plans by Frank A. Rommel, Weightman Bldg., Philadelphia, Pa., for additional dormitories; will open bids March 29; cost \$20,000. (Recently noted.)

W. Va., Clarksburg.—Board of Education is reported as to receive bids until April 3, through William B. Ittner, Board of Education Bldg., St. Louis, for high school; three stories; brick and stone; cost \$140,000. (Previously noted.)

W. Va., New Haven.—Board of Education of Graham District ordered election for April 5 to vote on \$10,000 bond issue to erect school.

## STORES

Ala., Birmingham.—Edwin Everett will erect two-story frame building at 1404 34th St.; cost \$3000.

Ala., Birmingham.—Park Development Co. will erect building at Park Ave. and 20th St.; brick; three stories; lower floor for stores; upper floors for apartments; cost \$40,000.

Ark., Chidester.—Chidester Mercantile Co. will rebuild store; 60x100 feet; fireproof construction; composition roof, gravel finish; cost \$5000; bids opened. (Recently reported burned.)

Ala., Gadsden.—W. L. Sampey will erect two-story brick building; cost \$6000 to \$7000.

Ark., Barber.—J. F. Wilson will rebuild store; 24x48 feet; mill construction; flat roof; glass front; rubber roofing. (Recently reported burned.)

Ark., Hot Springs.—E. G. Thompson, Little Rock, Ark., has plans by George R. Mann, Little Rock, for store and office building; five stories; lower floor for stores; upper floors for offices.

Fla., Jacksonville.—L. R. Wooton will erect two-story brick building on Davis St.; cost \$6200.

Fla., Lakeland.—V. V. Van Huss opens bids about April 10 to erect store and office building; 75x80 feet; three stories; ordinary construction; automatic elevators; tin roofing; cost \$20,000; plans by Talley & Sumner, 315 St. James Bldg., Jacksonville, Fla. (Recently noted.)

Fla., Miami.—Mrs. Queenia Condon, it is reported, will erect store and office building. (See "Stores.")

Fla., Miami.—R. T. Daniels will erect building on 11th St.; reinforced concrete construction; foundation to support 10 or 12 stories.

Fla., Sarasota.—J. H. Lord will erect business block and hotel building. (See "Hotels.")

Fla., St. Petersburg.—Detroit Hotel, C. N. Crawford, manager, accepted plans for hotel addition and store building. (See "Hotels.")

Fla., Lakeland.—Owen & Boswell will erect wholesale feed store; two stories; 45x100 feet.

Ga., Atlanta.—R. C. Darby, 127 Central Ave., will expend \$9000 to erect two-story 60x100-foot store and dwelling, etc. (See "Dwellings.")

Ga., Hartwell.—I. L. & W. E. McCurry will

expend \$6000 to erect building to contain three storerooms and office; one story; to cover 6000 square feet floor space; gravel roof; plans and construction by owner. (Recently noted.)

Ga., La Grange.—Pike Bros. and J. H. Edmondson will erect block of stores; 100 feet frontage; three or four stories.

Ky., Louisville.—A. Marks will erect brick store at 721 W. Market St.; cost \$4000.

Ky., Louisville.—Mrs. Ella T. Welch, Danville, Ky., James S. Ray of Louisville Trust Co., representative, Louisville, Ky., is reported as to expend \$40,000 to remodel Avenue Theater, to be occupied by J. G. McCrory Company, New York.

Ky., Louisville.—Whallen Bros. have plans by D. X. Murphy & Bros., 140 S. 5th St., Louisville, to rebuild store and office building; information may be had from architects. (Recently noted.)

La., New Orleans.—F. W. Woolworth Company, New York, F. M. Kirby, vice-president, Wilkes-Barre, Pa., will, it is reported, erect store building.

La., New Orleans.—C. L. Keppler, 1632 Dryades St., will expend \$22,000 to erect store building; 40x120 feet; fireproof; gas and electric lighting; freight and passenger elevator; plans by F. T. Daunic; construction by owner. (Recently noted.)

La., New Orleans.—Fidelity Homestead will erect building; cost \$3531.

La., New Orleans.—Equitable Real Estate Co., Ltd., E. Perrin, president, will erect building at 537-47 Baronne St. to be occupied by Barnett-Schaffer-Conner Company, Inc.; five stories; mill construction; pile foundation; 62x130 feet; two electric and two automatic electric passenger elevators; individual steam-heating plant; sprinkler system; cost about \$125,000; plans by Dilloll, Owen & Goldstein, Ltd., New Orleans. (Recently noted.)

Mo., Frederick.—L. E. Mullinix has plans by B. Evard Kepner, Frederick, for improvements to Pope property, to include new fronts on lower floor, erection of additions in rear, etc.; will provide apartments and offices on upper floors.

Miss., Sumner.—L. I. Rush will erect store building.

Miss., Sumner.—E. O. Palmer will erect store building.

Mo., Kansas City.—M. R. and E. C. Platt will erect brick stores at 201 Independence St.; cost \$15,000.

Mo., St. Louis.—Walter McKittrick of McKittrick Dry Goods Co. will erect residence; three stories; cost \$26,000.

Mo., St. Louis.—F. H. Manger, 5720 Van Vusen St., has plans for store and office building recently noted. (See "Bank and Office Buildings.")

Mo., St. Louis.—Charles Gietner will erect two-story store and tenement at 500 Bates Ave.; cost \$12,000.

Mo., St. Louis.—W. C. Burns, 4529 Gibson Ave., will erect store and tenement-house; 48x80 feet; ordinary construction; hot-water heat; composition roof; cost \$3500; construction by owner. (Recently noted under "Apartments.")

N. C., Carthage.—G. W. McNeill and H. F. Seawell will erect building; stores on lower floor; offices above.

N. C., Charlotte.—Equitable Realty Co. changed name to Merchants' Realty Co.; will remodel and improve Masonic Corner; three stories and erect store building.

S. C., Anderson.—H. C. Townsend will erect two buildings to cost \$23,000.

S. C., Charleston.—S. Steiner will erect building at E and Meeting Sts.; cost \$3000.

S. C., Greenville.—Poe Hardware & Supply Co. will erect store and warehouse building. (See "Warehouses.")

Tenn., Athens.—John E. Tuell will erect building on Jackson St.

Tenn., Nashville.—Goodlett Realty Co., 315 Fourth Ave., has plans by Robert Shays, Cole Bldg., Nashville, for two buildings, 21x156 feet and 21x76 feet; ordinary construction; heating and roofing not determined; H. Goodlett, 911 Shelby Ave., will supervise construction. (Recently noted.)

Tex., Abilene.—Walker-Smith Wholesale Grocery Co. will erect building to replace burned structure; two stories and basement; 10,400 square feet floor space; cost \$20,000 to \$25,000.

Tex., Cooper.—Rattan & Adair will erect brick business building.

Tex., Dallas.—P. P. Martinez will erect two-story brick building at 502 S. Harwood St.; cost \$14,000.

Tex., Dallas.—Sam Pattermostro will erect

two-story brick building at 2402 Leonard St.; cost \$6000.

Tex., Houston.—E. H. Hulsey, Galveston, Tex., is having plans prepared for store, office and theater building. (See "Theaters.")

Tex., Mason.—Kothman & Jordan will erect double-deck store building; 19x70 feet; fireproof construction.

Tex., San Antonio.—Charles Robinson, Waco, Tex., will erect two-story business building.

Tex., Temple.—F. A. Thompson, Gatesville, Tex., is organizing wholesale grocery company; will erect two-story building.

Tex., Temple.—Brady & Black have plans by J. H. Davis for store and office building; two stories and basement; 55x90 feet with "L" 30x60 feet; semi-fireproof and mill construction; heating not decided; gas and electric lighting; hand-power elevator, 8x12 feet, and sidewalk lift, 8x5 feet; old style tin or felt roof; construction supervised by Mr. Davis. (See "Machinery Wanted.")

Tex., Texas City.—R. E. McIlvaine, San Antonio, Tex., will erect business building; two stories; brick; frontage 75 feet.

Tex., Texas City.—A. H. Whited, Houston, Tex., will erect two-story brick business building; frontage 50 feet.

Tex., Victoria.—Fritz-George-Vanderberge Company is having plans prepared for business building; 89x165 feet; two stories and basement; brick.

Tex., Waco.—Dave Hawtof will erect two-story building; stucco; 50x60 feet; lower floor for store; upper floor for apartments.

Va., Cochrane.—A. B. Quillen will erect business building.

Va., Newport News.—S. W. Holt & Co. will erect store and office building; three stories; 100x100 feet; brick; concrete floors; driveways with room for three drays to permit wagons driving into building for loading and unloading.

Va., Richmond.—N. W. Howe will erect brick store at 311 E. Main St.; cost \$5000.

Va., Richmond.—R. Francione and G. W. Jackson will erect two-story brick store and dwelling; cost \$5000.

## THEATERS

Ala., Birmingham.—W. L. Delheim will erect brick theater on Avenue B between 19th and 20th Sts.; cost \$16,000.

Ala., Mobile.—William O. Daly and Jacob Tannebaum are reported to have acquired site, 114x156 feet, and to erect store, office and theater building at St. Joseph and St. Louis Sts.; fireproof construction. (Recently noted.)

Ky., Dawson Springs.—H. G. O'Kain will erect convention hall and theater; ordinary construction; steam heat; composition roof; cost \$8000; plans by A. L. Laester & Bro., Paducah, Ky. (Company headed by W. I. Hamby recently noted to erect building.)

Mo., Kansas City.—G. W. Ellsworth will erect moving-picture theater at 2519 E. 29th St.; cost \$1950.

Tex., Austin.—C. Pitts, H. E. Ford, C. O. Smith and associates are reported to erect \$200,000 theater.

Tex., Dallas.—Hann & Kendall state construction of theater (recently noted to be erected on property of Mrs. S. A. Gibbs) will be in the hands of their firm.

Tex., Dallas.—C. K. Jorgensen, owner of Crystal Theater, is having plans prepared by I. A. Walker for moving-picture theater on Elm St. between Stone & Ervay Sts.; cost \$190,000.

Tex., Houston.—E. H. Hulsey, Galveston, Tex., is having plans prepared by C. D. Hill & Co., Dallas and Houston, Tex., for theater, office and store building recently noted; 100x100 feet; three stories; fireproof; heating, lighting, etc., not determined; cost \$125,000; plans probably ready by April 20. (See "Machinery Wanted.")

Tex., Mt. Pleasant.—M. Greenspun, care of Parker-Brown Company, Fort Worth, Tex., contemplates erecting moving-picture theater.

Tex., Orange.—Mrs. H. J. Litcher is having plans prepared by Harry Creighton Ingel, New York, for theater; two stories; fireproof. (Previously noted.)

Tex., Orange.—H. Thomas will erect frame theater; seating capacity about 400.

## WAREHOUSES

Ala., Birmingham.—Salvation Army, 129 W. 14th St., New York, opens bids May 15 to erect building for handling waste paper; capacity, three tons daily; 48x84 feet; ordi-



nary construction; cost \$9000; plans by W. J. Barker, 129 W. 14th St., New York. (Recently noted under "Miscellaneous.")

Ky., Lexington.—Burley Tobacco Co. will erect warehouse; frontage 160 feet.

Ky., Louisville.—B. B. Davis, architect, Louisville, will soon award contract for proposed warehouse for Standard Sanitary Manufacturing Co.; nine stories; reinforced concrete; equipment to include elevators, conveying machinery, pump, boilers, etc.

Ky., Mt. Sterling.—Farmers' Tobacco Warehouse Co. will increase capital stock from \$30,000 to \$45,000 and expend \$15,000 for improvements.

La., Crowley.—Standard Milling Co. will erect warehouse.

Md., Baltimore.—Bluthenthal & Bickart, 301 E. Lombard St., will erect warehouse; 50,000 square feet floor space; three stories; concrete or mill construction; bids opened in four or five weeks.

Md., Easton.—Easton Wholesale Grocery Co. plans to erect warehouse.

Mo., Kansas City.—Emerson-Brantingham Implement Co., Rockford, Ind., will erect brick warehouse at 1414 Union Ave.; cost \$5000.

Mo., St. Louis.—Rock Island-Frisco Terminal Co., W. C. Nixon, president, contemplates erecting public fruit auction and storage building on half block bounded by Dickson and O'Fallon Sts., Broadway and alley; 150x200 feet; auction room with 45,000 square feet floor space; cold-storage plant covering second floor and having capacity of 750 carloads fruit; cost \$150,000. (Recently noted to be erected by Chicago, Rock Island & Pacific Railway Co.)

## BUILDING CONTRACTS AWARDED

### APARTMENT-HOUSES

Fla., Jacksonville.—D. L. Rathbone awarded contract to erect apartment-house; 32x93 feet; two stories; two apartments; ordinary construction. (Recently noted.)

Ga., Atlanta.—Purchase Money Note Co., 1006 Fourth National Bank Bldg., awarded contract to erect negro apartment building; eight apartments; frame; gravel roof; cost \$6000; plans by F. B. Crowell, 1019 Fourth National Bank Bldg., Atlanta. (Recently noted.)

La., New Orleans.—Miss Schwabacher awarded contract to W. U. Landry to erect two-story apartment-house on Pitt St.; two stories; cost \$10,000.

Mo., St. Louis.—R. H. Bohle awarded contract to Charles F. Mueller, Giles and Potomac Sts., St. Louis, to erect double tenement-house; eight family apartments; mill construction; ordinary roofing; cost \$10,000; plans by Milhofer & Mueller, Giles and Potomac Sts., St. Louis. (Recently noted.)

N. C., Statesville.—Mrs. R. E. Noe awarded contract to T. L. Steele, Statesville, to erect apartment-house; two and one-half stories; four apartments; fireproof construction; hot-water heat; electric lighting; asbestos roof; cost \$10,000; plans by Wheeler & Stern, Charlotte, N. C. (Recently noted.)

S. C., Charleston.—Bluestein Bros. awarded contract to George A. Clayton, Atlanta, Ga., to remodel building for apartments and stores. (See "Stores.")

S. C., Columbia.—Consolidated Holding Co. awarded contract to erect apartment and store buildings. (See "Stores.")

Tex., Dallas.—H. L. Edwards and Felix Webster awarded contract to erect store and apartment building. (See "Stores.")

Va., Richmond.—Orrin B. White awarded contract to P. J. White & Son to erect four two-story brick tenement-houses on Sycamore St. between Main St. and Floyd Ave.; cost \$10,000.

Va., Richmond.—W. J. Gilman awarded contract to J. J. Tignor, Richmond, to erect two-story brick tenement-house at 706-10 Brook Ave.; lower floor for stores; cost \$5000. (Recently noted.)

W. Va., Dunn.—Funn & Anderson awarded contract to erect building to contain living-rooms on upper floor. (See "Bank and Office.")

### ASSOCIATION AND FRATERNAL

Tenn., Nashville.—Fraternal Order of Eagles awarded contract to C. W. Rives, Nashville, to remodel interior of building for lodge purposes; three stories; brick; ordinary construction; cost \$5000. (Previously noted.)

### BANK AND OFFICE

Ala., Birmingham.—Sub-contracts for Jefferson County Savings Bank, to cost \$1,000.

N. C., Greensboro.—North Carolina Public Service Co. will erect storage warehouse; sheet iron; cost \$3000.

S. C., Greenville.—Poe Hardware & Supply Co. will erect warehouse at River and Court Sts.; four stories; 50x125 feet; plate-glass front; store on ground floor; upper floors for warehouse.

Tex., Dallas.—Sonnenborn Bros., New York, H. J. Cohn, southwestern manager, Dallas, will erect warehouse.

Tex., Dallas.—Boren-Stewart Company is having plans prepared by Lang & Wittich, Dallas, for building; three stories and basement; fireproof; steel and concrete; cold-storage cellars in basement; offices of company on lower floor front; upper floors for warehouse purposes; elevators, sliding chutes, ventilating system, etc.; total cost \$200,000.

Tex., Dallas.—Southwestern Sundries Co., James Lyons secretary, It is reported, will erect building; probably eight stories.

Tex., Houston.—Lammus Cotton Gin Co., Columbus, Ga., It is reported, will erect warehouse.

Tex., Houston.—Henry Henke will erect three-story warehouse on 3d St.; reinforced concrete; cost \$22,000; will be occupied by Hobson Electric Co.

Tex., Yonkum.—Green & Welhausen have plans by J. Henry Yentzen for two brick warehouses; fireproof doors and windows.

W. Va., Hinton.—Hinton Warehouse Co., incorporated with capital stock of \$20,000 by Bradford Noyes, Roger A. Young, Joseph Ruffner, T. Waters and J. T. Arbuckle, all of Charleston, W. Va.

000, have been awarded as follows: Elevators to Otis Elevator Co., New York; terra-cotta to Federal Terra-Cotta Co., Chicago, Ill.; marble to Alabama White Marble Co., Birmingham; plumbing to Cooney Company, New York; wiring and heating to F. E. Newberry Company, both of New York; general contract awarded to F. W. Mark Construction Co., Birmingham; plans by William C. Weston, Birmingham. (Previously more fully detailed.)

Ark., Little Rock.—S. J. Skillern awarded contract to erect store and office building. (See "Stores.")

Ky., Whitesburg.—D. D. Fields (not D. D. Fuels as recently noted) awarded contract to John Mullins, Appalachia, Va., to erect office building; 30x30 feet; semi-fireproof; metal roof; cost \$3000; plans by T. W. Kirkbride, Roanoke, Va.

Miss., Coldwater.—M. H. Daly awarded contract to erect building to contain offices, etc. (See "Stores.")

Md., Easton.—Emerson-Brantingham Implement Co., Rockford, Ill., awarded contract to erect office and warehouse building. (See "Warehouses.")

N. C., High Shoals.—A. Q. Kale awarded contract to erect store and office building. (See "Stores.")

Okl., Chickasha.—Dr. R. P. Tye awarded contract to erect store and office building. (See "Stores.")

Tenn., Memphis.—Commercial Trust and Savings Bank awarded contract to Consolidated Engineering Co., 61 Gunther Bldg., Baltimore, Md., to erect bank and office building; 15 stories; 50x149 feet; reported to be of steel, brick and stone construction; cost \$400,000; plans by Charles O. Pfeil, 1403 Tennessee Trust Bldg., Memphis. (Recently noted.)

Tex., Dallas.—C. C. Cobb awarded contract to erect store and office building. (See "Stores.")

Tex., Kenedy.—First State Bank & Trust Co. awarded contract to Neumann Bros., Kenedy, to erect bank building.

W. Va., Beckley.—Dunn & Anderson awarded contract to erect building; two stories; brick; eight rooms; lower floor for offices; upper floor for living rooms.

W. Va., Clarksburg.—Owens Eastern Bottle Co. awarded contract to erect two-story cement office building. (See "Electric Plants.")

W. Va., Warwood.—Bank of Warwood awarded contract to Bodley & Phillips to erect bank building; two stories and basement; brick and stone. (Recently noted.)

### CHURCHES

Ark., Argenta.—Dye Memorial Church awarded contract to Lamberson & Phillips, Argenta, to erect church building; pressed

brick; concrete foundation; 16 rooms; auditorium to seat 700; cost \$15,000; plans by Frank M. Blaisdell, Little Rock. (Previously noted.)

Fla., Tampa.—Tampa Heights Methodist Church awarded contract to H. P. Stettler to erect church building; auditorium to seat 600, with annex will be increased to 900; cost \$35,000. (Recently noted.)

Ga., Manchester.—Methodist Episcopal Church South will expend \$3000 to erect building; 42x72 feet; ordinary construction; electric lighting; shingle roof; plans by I. N. Johnson, Manchester; contract recently noted awarded to J. P. Corley, Manchester.

Ga., Savannah.—First Church of Christ, Scientist, has plans by and awarded contract to W. A. Chaffee, Savannah, to erect building; colonial design; 36x60 feet; ordinary construction; metal shingle roof; cost \$3000. (Recently noted.)

Ky., Whitesburg.—Whitesburg Baptist Church awarded contract to B. F. Smith Fireproof Construction Co., 817 11th St. N. W., Washington, D. C., to erect church building to cost \$10,000.

W. Va., Elm Grove.—Stone Church congregation awarded contract at \$22,385 to erect church building, exclusive of heating, seating, plumbing, etc.; total cost about \$40,000; plans by C. W. Cates, Wheeling, W. Va. (Recently noted.)

### CITY AND COUNTY

Ky., Jeffersonstown.—Poorhouse, etc.—Fiscal Court of Jefferson county awarded contract at \$3800 and \$21,786, respectively, to construct reservoir and erect main building at county poor farm, and at \$2876 to J. S. McWilliams for heating system; plans by Brinton B. Davis, Louisville, Ky. (Recently noted.)

Okl., Hennessey.—City Hall, etc.—City awarded contract to erect city hall, jail and opera-house building; 50x102 feet; fireproof construction; steam heat; gravel roof; cost \$10,000; plans by R. W. Shaw, Enid, Okla. (Recently noted.)

S. C., St. Matthews.—Jail.—Calhoun county awarded contract to erect courthouse and jail. (See "Courthouses.")

Tex., Belton.—Jail.—Bell County Commissioners have plans by and awarded contract at \$13,590 to Southern Structural Steel Co., San Antonio, Tex., to repair jail; will provide 16 new cells and basement containing eight cells. (Recently noted.)

Va., Christiansburg.—Jail.—Montgomery County Supervisors awarded contract at \$13,646 to R. K. Stewart, Roanoke, Va., to erect jail; plans by G. R. Ragan, 613 Watt & Blay Bldg., Roanoke, Va. (Recently noted.)

### COURTHOUSES

Ky., Bardwell.—Carlisle county awarded contract to Falls City Construction Co., Louisville, Ky., to remodel courthouse; 70x80 feet; fireproof; steam heat; electric lighting; slate roof; plans by Andrew J. Bryan. (Previously noted.)

Ky., Shelbyville.—Shelby County Commissioners awarded contract at \$87,964 to Falls City Construction Co., Louisville, Ky., to erect courthouse; at \$4936 to Kuhn & Co., Shelbyville, for plumbing and heating, and at \$1919 to Marine Electric Co., Louisville, Ky., for wiring; plans by Joseph & Joseph, Louisville, Ky., call for modification classic Greek style; 85x125 feet; four entrances; cream-colored stone walls faced with ashley stone and carved-stone ornaments; Spanish red tile roof; vari-colored ornamental plaster work in corridors and main courtroom. (Recently noted.)

S. C., St. Matthews.—Calhoun county awarded contract at \$19,600 to W. P. Rose, Goldsboro, N. C., to erect courthouse and jail according to plans by W. A. Edwards, Candler Bldg., Atlanta, Ga. (Recently noted.)

### DWELLINGS

D. C., Washington.—A. C. Moses Construction Co., 916 New York Ave. N. W., Washington, has contract to complete operation of 39 dwellings in southeastern section of city, to cost \$121,000; ten completed and five under construction.

Fla., Jacksonville.—L. T. Smith, 2379 St. John's Ave., awarded contract to N. L. Snelson, St. James Bldg., Jacksonville, to erect 74x48-foot dwelling and 20x28-foot garage; fireproof construction; steam heat; electric lighting; tile roof; cost \$17,000; plans by Talley & Somers, St. James Bldg., Jacksonville. (Recently noted.)

Fla., Lakeland.—Methodist Church will expend \$4000 to erect parsonage; 19 rooms; ordinary construction; cypress shingle roof;

contract recently noted awarded to Marshall & Sanders.

Fla., Orlando.—Charles Tiedtke, Toledo, O., It is reported, awarded contract to O. N. Larson, Orlando, to erect residence; two stories; frame; 15 rooms and four baths; screened throughout with copper screen wire; green tile roof; gas and electric lights; kitchen and servants' rooms (also supplied with bath) separate from main building by breezeway.

Ga., Atlanta.—John T. Williams awarded contract to C. E. Miller to erect one-story frame dwelling at 88 Cleburne St.; cost \$3500.

Ga., Savannah.—Mrs. Lucile F. Cornell, 832 E. Duffy St., has plans by and awarded contract to Edward F. Barrow to erect proposed dwelling; 32x42 feet; ordinary construction; gas and electric lighting; old-style tin roof; cost \$4000.

Ky., Eddyville.—C. T. Kipping awarded contract through architects, A. L. Lassiter & Bro., Paducah, Ky., to erect dwelling; hot-air heat; cost \$4000.

La., New Orleans.—French Market Home-stand will erect two-story residence; cost \$3743; contract awarded.

Md., Baltimore.—Emory C. Stock, 3619 Clifton Ave., awarded contract to J. Glover to erect addition to residence; brick; three stories; 29x29 feet; cost about \$3500; plans by Henry J. Tinley, 312 N. Charles St., Baltimore.

Md., Catonsville.—Dr. F. H. Baetjer will expend \$5000 to erect dwelling; frame; hot-water heat; shingle roof; plans by Walter M. Gieske, Gunther Bldg., Baltimore, Md.; contract recently noted awarded to John H. Gerwig, Catonsville.

Mo., Kansas City.—Ellen P. Weeks has plans by and awarded contract to Alexander Hutchison, Kansas City, to erect dwelling; 32x32 feet; ordinary construction; shingle roof; cost \$6000. (Dr. Carl H. Weeks recently noted to erect dwelling.)

N. C., Asheville.—C. G. Memminger awarded contract to Wrenn & Garland, 69 S. Main St., Asheville, to erect residence and garage; pressed brick; stone trimmings; clay tile and sheet copper roof; leaded glass for windows; cost \$37,000; plans by Bishop & Greer. (Previously noted.)

S. C., Greenville.—Anita L. Fishburne, 317 Calhoun St., Anderson, S. C., awarded contract to Gramby & Son, Greenville, to erect several dwellings; six rooms each; ordinary construction; shingle roof; cost \$1500 each. (Recently noted.)

Tenn., Memphis.—E. H. Voegell awarded contract to Fields & Boots to erect two five-room dwellings at 1746-1752 Euclid Ave.; cost \$4000.

Tenn., Memphis.—A. E. Patten awarded contract to J. J. Mackey to erect six-room frame residence; cost \$3000.

Tex., Austin.—H. C. Craig awarded contract to W. D. Allison to erect residence; 12 rooms and 2 baths; cypress shingle roof; cost \$6000; plans by owner. (Recently noted.)

Tex., Hearne.—E. S. Crocker awarded contract to Mr. Hearne to erect cottage.

Tex., Houston.—J. S. Bieker awarded contract to F. W. McNeir, Houston, to erect five-room residence; mill construction; electric lighting; metal shingle roof; cost \$3000. (Recently noted.)

Tex., Lubbock.—W. B. Atkin awarded contract to erect dwelling recently noted.

Tex., Riviera.—J. B. Womack awarded contract to Hal Rannels to erect two-story residence; nine rooms.

Va., Richmond.—F. E. Hatcher awarded contract to E. W. Merriman to erect three-story brick dwelling on Boulevard between Taylor and Cary Sts.; cost \$6500. (Recently noted.)

Va., Richmond.—George E. Dubert will erect dwelling; two stories; brick; slag roof; cost \$4865; awarded contract to Davis & Archer, Richmond.

Va., Richmond.—Louis H. Blair will expend \$3500 (not \$7500, as recently reported) to erect dwelling; 50x80 feet; ordinary construction; hot-water heat; electric lighting; slate roof; plans by Walter D. Blair; contract awarded to W. S. Quarles, 2612 Hanover St., Richmond.

W. Va., Gary.—United States Coal & Coke Co. is reported as to erect 200 dwellings at its different operations; wires Manufacturers Record: "As soon as contracts are let will give particulars."

### HOTELS

Ala., Birmingham.—Roden Hotel Co. awarded sub-contracts as follows for erection of hotel: Otis Elevator Co., New York.

for elevators; F. E. Newberry, St. Louis, Mo., for electric wiring and heating; Alabama White Marble Co., Birmingham, for marble; P. Mulloy, Chicago, Ill., for plumbing fixtures and connections; American Bridge Co., 71 Broadway, New York, for steel; general contract awarded to F. W. Mark Construction Co., Birmingham; total cost about \$1,000,000. (Other details previously noted.)

Fla., Seabreeze.—Henry W. Haynes will expend \$50,000 to erect hotel, for which contract was recently noted awarded to D. F. Finquay, Daytona Beach, Fla.; 29x126 feet; concrete blocks first story; ordinary construction; steam heat; electric lighting; galvanized shingle roof; plans by J. Arthur McVance, Pittsfield, Mass. (See "Machinery Wanted.")

### MISCELLANEOUS

Ala., Mobile.—Stable.—Mobile Gas Co. awarded contract to H. Hancock, Mobile, to erect stable, etc. (See "Warehouses.")

Mo., Frederick.—Engine-house.—Junior Fire Company awarded contract to H. Mehrl Gittinger to erect building; 37 feet by 52 feet 11 inches; 41 feet high; tower 11 feet square; hall to seat 350 people; apparatus room, 34x60 feet; plans by R. Eward Kepner, Frederick. (Recently noted.)

Miss., Coldwater.—Postoffice, etc.—M. H. Daily awarded contract to erect building to contain postoffice, lodgerooms, etc. (See "Stores.")

N. C., Charlotte.—Clubhouse.—Mecklenburg Country Club awarded contract to John Blythe to erect addition to and improve clubhouse. (Previously noted.)

N. C., Hendersonville.—Hospital.—Contracts for Patton Memorial Hospital have been awarded to J. V. Helsel, Hendersonville, for roofing and tin work, and to J. W. McIntyre, Hendersonville, for plumbing fixtures.

N. C., Pineview.—Barns, etc.—Sever-Fall Farm, George T. Kearsley, secretary, awarded contract to erect 26 barns and packing-houses. (See "Canning and Packing Plants" and "Machinery Wanted.")

### RAILWAY STATIONS, SHEDS, ETC.

Ky., Mayfield.—Illinois Central Railroad Co., A. S. Baldwin, chief engineer, Chicago, Ill., awarded contract to W. H. Spradlin, Fulton, Ky., to erect depot; 107 feet 3 inches by 29 feet 7½ inches; ordinary construction; hot-water heat; tile roof; cost \$14,000; plans by J. A. Taggart, care Illinois Central Railroad Co., Chicago, Ill. (Recently noted.)

N. C., Woodrow (not a postoffice).—Tennessee and North Carolina Railroad, H. F. Holt, chief engineer, Newport, Tenn., awarded contract to erect depot.

Tex., Bellville.—Gulf, Colorado & Santa Fe Railway Co., F. Merritt, chief engineer, Galveston, Tex., awarded contract for plumbing in stations at Bellville, Cameron and Caldwell, Tex., to J. B. Collins, Houston, Tex. (General contracts recently noted awarded to Street & Born, Houston, Tex.)

Tex., Caldwell.—Gulf, Colorado & Santa Fe Railway Co., F. Merritt, chief engineer, Galveston, Tex., awarded plumbing contract for station building. (See Tex., Bellville.)

Tex., Cameron.—Gulf, Colorado & Santa Fe Railway Co., F. Merritt, chief engineer, Galveston, Tex., awarded plumbing contract for station. (See Tex., Bellville.)

### SCHOOLS

Ky., Whitesburg.—City awarded contract to B. F. Smith Fireproof Construction Co., 817 14th St. N. W., Washington, D. C., to erect \$32,000 graded school building.

Tenn., Knoxville.—County High School Board awarded contract at \$890 and \$8500, respectively, to R. M. Callaway & Co., Le-noir City, Tenn., to erect Karnes School at Beaver Ridge and Gigs School at Harbison's Cross Roads; also awarded contracts at \$1250 each to James A. Hanlin & Son to install heating systems and structures. (Recently noted.)

Va., Coeburn.—City awarded contract to D. J. Phipps, Newport News, Va., to erect high school building; 110x67 feet; two stories and basement; ordinary slow-burning construction; direct and indirect steam heat; electric lighting; composition roof; plans by Holmboe & Lafferty, Clarksburg, W. Va. (Recently noted to cost \$30,000.)

W. Va., Parsons.—City awarded contract to Holbert & Spedden, Fairmont, W. Va., to erect high school; 71x112 feet; ordinary or mill construction; mechanical air heating; gas lighting; built-up roofing; cost \$23,000; plans by Holmboe & Lafferty, Clarksburg, West Virginia.

### STORES

Ark., Little Rock.—S. J. Skillern awarded contract to Oklahoma City Construction Co., Oklahoma City, Okla., to erect store and office building on Scott St.; three stories; brick; six stores on ground floor; offices above; cost \$40,000; plans by Theodor M. Sanders, Little Rock. (Recently noted.)

D. C., Washington.—Franklin T. Sanner, 18th St. and Columbia Rd., awarded contract to A. C. Moses Construction Co., 916 New York Ave. N. W., Washington, to erect building at 1508 H St. N. W.; four stories; front, stone and glass; cost \$30,000; plans by Appleton P. Clark, Jr., 816 14th St. N. W., Washington.

Ga., Atlanta.—M. L. Hirsch awarded contract to Griffin Construction Co., Atlanta, to remodel building on W. Peachtree St.; cost \$4000.

Md., Baltimore.—J. Wilson Leakin, 813 Fidelity Bldg., awarded contract to J. J. Moylan, 117 E. Center St., Baltimore, to erect store building at 319 W. Mulberry St.; two stories; brick; 20x58 feet; steam heat; cost \$4500; plans by J. C. Spedden, Baltimore.

Miss., Coldwater.—M. H. Daily awarded contract to erect building to contain store, postoffice, offices and lodgerooms; two stories.

Mo., Kansas City.—M. R. and E. C. Platt awarded contract to J. T. Patterson to erect store building at 201-207 Independence Ave.; three stories; brick and stone; cost \$15,000.

Mo., St. Louis.—S. D. Greyson awarded contract to George Schuetheir, 416 N. Broadway, St. Louis, to erect store building; 50x30 feet; ordinary construction; electric lighting; gravel roof; cost \$4000; plans by owner. (Recently noted.)

N. C., High Shoals.—A. Q. Kale, manager of High Shoal Mills, awarded contract to erect building; two stories; pressed brick and plate-glass front; lower floor for stores; upper floor for offices.

Okla., Chickasha.—Dr. R. P. Tye awarded contract to Libse-Dunning Construction Co., Oklahoma City, Okla., to erect building; two stories; 50x113 feet; hard tapestry brick; steam heat; hot and cold water in all rooms; four stores on ground floor; offices above.

S. C., Charleston.—Binestein Bros. awarded contract to George A. Clayton, Atlanta, Ga., to remodel store building; 110 feet long; fireproof construction; metal ceiling; slate roof; to contain four apartments above; plans by J. D. Newcomer, Charleston. (Recently noted.)

S. C., Columbia.—Consolidated Holding Co. awarded contract to F. D. McNulty, Columbia, to erect eight stores and apartments; 200x100 feet; ordinary construction; tapestry brick; terra-cotta and tile fronts; copper cornices; electric lighting; Barrett's specification roofing; plans by Hamby & Rorke, Columbia. (Recently noted to erect several stores.)

Tenn., Memphis.—W. E. Wilborne will erect six-room brick store at Cooper St. and Young Ave.; cost \$6000; awarded contract to D. L. Couch.

Tex., Dallas.—H. L. Edwards and Felix Webster awarded contract to Lindsley & Smith to erect store and apartment building at Ervay and Wood sts.; three stories; lower floor for stores; upper floors for apartments; cost \$40,000; plans by C. D. Hill & Co., Dallas. (Recently noted.)

Tex., Dallas.—C. C. Cobb awarded contract to H. C. Curtis to erect store and office building; two stories and basement; 100x100 feet; cost \$35,000; plans by C. D. Hill & Co., Dallas, Tex.

Tex., Houston.—Mrs. B. Hite of New York awarded contract to Street & Born, Houston, to erect building to contain eight stores; cost \$15,000.

Tex., Texas City.—W. H. Gonne has plans by and awarded contract to C. W. Vanvactor to erect store building; 31x72 feet; ordinary brick construction; electric lighting; paper and gravel roof; cost \$6500. (Recently noted.)

Va., Richmond.—W. J. Gilman awarded contract to erect store and apartment building. (See "Apartment-houses.")

### THEATERS

Ky., Pikeville.—Sam Sand Mercantile Co. awarded contract to erect theater; fireproof; concrete block; metal ceiling; asbestos curtain; seating capacity 1000; 30x100 feet.

Miss., Meridian.—S. H. Floyd awarded contract to erect theater according to plans by P. J. Krouse, Meridian; cost \$30,000; will be occupied by Feature Film Co. (Recently noted.)

Okla., Enid.—J. S. Featherston awarded con-

tract to Donoho & Wheeler, Box 574, Enid, to erect store building to be occupied by National Biscuit Co. and J. I. Case Machine Co.; 96 feet 6 inches by 124 feet; semi-fireproof construction; electric lighting; gravel roof; cost \$10,000; plans by Roy Shaw, Enid. (J. S. Featherston recently noted to erect building.)

Tex., Mineral Wells.—W. B. Mayes will expend \$10,000 to \$12,000 to erect theater; 50x100 feet; brick, iron and wood; metal roof; plans by C. H. Leinbach, Mineral Wells; contract awarded. (Recently noted.)

### WAREHOUSES

Ala., Mobile.—Mobile Gas Co. awarded contract to H. Hancock, Mobile, to erect two-story brick warehouse, 40x30 feet; and one-story brick stable, 27x38 feet; plans by Hutchisson & Denham.

Md., Easton.—Emerson Brantingham Implement Co., Rockford, Ind., will erect warehouse and office building; 60x100 feet; one story; 14-foot walls above ground; wood-trussed roof; heating and lighting undecided; cost \$3000; plans by A. M. Culp, Chestertown, Md.; contract awarded to W. S. & A. M. Culp, Chestertown, Md.

## RAILROAD CONSTRUCTION

### RAILWAYS

Ga., Nashville.—President J. A. J. Henderson of the Ocala Southern Railroad, Ocala, Ga., is quoted saying that an extension may be built some time from Nashville to Waycross, Ga., about 60 miles, and thence to the seacoast, as far again.

Ky., Winchester.—Mason, Hanger & Carmichael, contractors, are reported to have given a subcontract to Carr & Gibson on the double tracking of the Louisville & Nashville Railroad from Winchester to Reuk.

La., Baton Rouge.—The Louisiana Railway & Navigation Co. has completed its belt railroad in Baton Rouge and operated the first train over it.

La., Lake Charles.—The Kansas City Southern Railroad is expected to make an addition to its yards at Lake Charles. C. E. Johnston is chief engineer at Kansas City, Mo.

La., New Iberia.—Plans for the construction of the proposed New Iberia & Gulf Railroad are reported complete and its construction from New Iberia to Weeks Island is assured. The Board of Trade at New Iberia may give information.

Md., Baltimore.—President Samuel Rea of the Pennsylvania Railroad Co. has written to Mayor James H. Preston of Baltimore suggesting a conference between him and other city officers and officials of the railroad company concerning contemplated changes and enlargements to improve the freight terminals around Calvert Station in the heart of the city. The construction contemplated includes practically all classes of work usual in connection with the establishment of adequate freight-handling facilities by a trunk line in a large city, but exactly what will be done remains to be settled by the proposed conference, to which the Mayor agrees. A. C. Shand, Broad St. Station, Philadelphia, is chief engineer of the railroad company.

Miss., Houlika.—The Ferguson & Palmer Co., with headquarters at Paducah, Ky., will build 10 miles of railroad from Houlika to timber lands. Earl Palmer is president, John K. Ferguson secretary, and R. S. Robertson treasurer.

N. C., Beaufort.—Charter has been granted at Raleigh to the Beaufort Terminal Railway Co., of which E. C. Duncan, a director of the Norfolk Southern Railroad, and other officers of that line are incorporators. It is to build a railroad about 12 miles long from Beaufort to Cape Lookout, and also to construct terminals there. F. L. Nicholson, Norfolk, Va., is chief engineer of the Norfolk Southern. (See Manufacturers Record, March 6.)

N. C., Concord.—The Norfolk & Southern Railroad Co., says a report, contemplates construction of a branch from Mt. Pleasant on its Charlotte extension, to Concord, about six miles. F. L. Nicholson, Norfolk, Va., is chief engineer.

S. C., Greenville.—The Southern Railway, according to a local report, will spend about \$12,000 in building a siding about two blocks long and the construction of which will require considerable piling along the river. B. Herman is chief engineer at Washington, D. C.

N. C., Hendersonville.—The Saluda-Hendersonville Interurban Railway Co., recently

Mo., Kansas City.—M. Rumely Products Co., La Porte, Ind., will erect two-story brick warehouse in North Kansas City; 550x113 feet; cost \$100,000; will also establish central distributing plant; further information from F. W. Pratt, 430 Midland Bldg., Kansas City. (Recently reported under "Stores" as awarding contract to MacLean Construction Co. of Chicago, Ill.)

Tex., Austwell (not a postoffice).—Refugio Land & Irrigation Co., Tivoli, Tex., awarded contract to erect warehouse. (See Tex., Tivoli.)

Tex., Orange.—Dr. E. W. Brown awarded contract to A. F. Howard to erect warehouse on Wilson farm; cost \$5000.

Tex., Tivoli.—Refugio Land & Irrigation Co. awarded contracts to Jopling & Williams, Wharton, Tex., to erect proposed warehouses at Tivoli and Austwell, Tex. (latter not a postoffice); each to be 61x100 feet; brick walls; cement floor; Barrett tar and gravel roofing; metal sash, frames, wire glass and skylights; cost \$6000 each; plans by Hull & Praeger, Victoria, Tex.

Va., Petersburg.—British-American Tobacco Co., 111 Fifth Ave., New York, it is reported, will erect 10 storage warehouses; awarded contract to E. L. Bass, South Richmond, Va.

reported chartered, will, it is stated, build an electric railway from Hendersonville via Flat Rock and Saluda to a point on Green River. J. M. Torrance of Bessemer City, U. G. Staton of Hendersonville, W. A. Mauney and C. E. Neider of King's Mountain, N. C., are interested.

N. C., Selma.—W. Z. Williams & Co. of Macon, Ga., have been awarded contract by the Atlantic Coast Line for concrete masonry necessary in the construction of second track from Parkton to Selma, N. C., 63 miles. D. W. Gross is engineer of construction and E. B. Pleasants chief engineer at Wilmington, N. C.

Okla., Stillwater.—Oklahoma Public Service & Interurban Lines have filed mortgage to the Hudson Trust Co., New York, for \$4,500,000 of 6 per cent. bonds for the proposed railway system. Louis J. Lampe, Stillwater, Okla., is general manager and chief engineer. (See Manufacturers Record, March 13.)

S. C., Greenville.—The Southern Railway, it is announced, will build at Greenville two additional team tracks of about 500 feet each; extend another team track 160 feet; extend three freighthouse tracks each 150 feet, and also build a storage track 80 feet long. B. Herman, Washington, D. C., is chief engineer.

Tenn., Centerville.—The Business Men's Club of Centerville has been organized to succeed the old Commercial Club and to participate in a movement for the construction of a railroad from Corinth, Miss., to Nashville, Tenn. J. B. Walker is president, and Emmett D. Thompson, secretary. Clifton Thomas, secretary of the Business Men's Club of Corinth, Miss., may also give information.

Tenn., Harriman.—E. T. Schorn, Robert Shaw, Charles Fonde and Herbert Dodson of Knoxville are reported surveying near Harriman for a railroad plan which will reach Kingston, Tenn.

Tenn., Nashville.—The Nashville & Gallatin Interurban Electric Railway Co. is reported to have completed tracklaying all the way into Gallatin, and the road will soon be put in operation. H. H. Mayberry, Nashville, Tenn., is president.

Tex., Beaumont.—The Kansas City Southern Railroad, it is reported, will enlarge its yards at Beaumont. C. E. Johnston is chief engineer at Kansas City, Mo.

Tex., Dallas.—J. W. Everman, general superintendent Texas & Pacific Railway, is quoted saying that the line from Texarkana via Dallas to Fort Worth, 216 miles, will be rebalasted, and that new rails will also be laid over a considerable part, new steel having been ordered for 100 miles, half being 75 pounds per yard and half 85 pounds. C. H. Chamberlain, Dallas, Tex., is chief engineer.

Tex., Orange.—Contract is reported closed for the extension of the Orange Northwestern Railroad from Vinton to Orange, Tex., 11 miles. Ed Kennedy is president at Houston, Tex.

Tex., Ferris.—Tracklaying is reported begun on the branch of the Southern Traction Co. from Ferris to Corsicana, Tex.

Tex., Freport.—Missouri, Kansas & Texas Railway is reported to have bought Houston & Brazos Valley Railway, which will be ex-



tended about three miles to Freeport, and build terminal tracks and other facilities. Felix Jackson, Velasco, Tex., is president of latter line.

**Tex., Jackboro.**—The Gulf, Texas & Western Railway has completed tracklaying on its extension from Jackboro to Salesville, connecting there with the Weatherford, Mineral Wells & Northwestern Railway. The extension is to be put in service immediately.

**Tex., Sterling City.**—The Gulf, Colorado & Santa Fe Railway Co. denies the recent press report that it was surveying in the vicinity of Sterling City for an extension.

**Tex., Teague.**—Plans are under way, says a report, for the construction of a railroad from Teague via Bristol, Alsford and Tellico to Paris, Tex., about 80 miles. Secretary of the Board of Trade at Teague may be able to give information.

**Va., Bowling Green.**—L. E. Martin of Bowling Green says it is contemplated to put in a three-mile line from Bowling Green to Milford, Va., and operate storage battery cars.

**Va., Lynchburg.**—Curtis & Shumway have begun work on the contract for second track on the Southern Railway from Monroe to Tye River with two steam shovels. Engineering headquarters at Amherst, Va.

**Va., Radford.**—Ashby Wygal is making survey for the proposed railroad from Radford, Va., to Mount Airy, N. C., about 70 miles, the engineers being on that part of the line from the summit of the Blue Ridge to Mount Airy. Dr. J. J. Mott and others are interested.

**Va., Richmond.**—President Finley of the Southern Railway is credited as announcing that 18 yard tracks and two interchange tracks are to be built in the South Richmond yards as an addition to the facilities there. B. Herman, Washington, D. C., is chief engineer.

**Va., West Point.**—The Southern Railway is reported to have begun reconstruction on the line from West Point to Richmond, Va., about 40 miles. A steam shovel is employed at Romaneke to revise a curve.

**W. Va., Barboursville.**—The Chesapeake & Ohio Railway, says a report, will build about two miles of yard tracks at Barboursville for a terminal of the Guyan Valley branch. F. J. Cabell is chief engineer at Richmond, Va.

**W. Va., Coalwood.**—George L. Carter, Johnson City, Tenn., is reported having plans made for the construction of an electric railway from Coalwood to Caretta, W. Va., 5 miles.

**W. Va., Fayetteville.**—The Fayette Traction Co., which proposes to build an electric railway from Fayetteville to Fayette Station, 4½ miles, has, it is reported, decided to invite the Westinghouse Company to investigate the proposition, for which \$32,200 of stock in a total of \$50,000 is already subscribed. Directors: C. W. Dillon, president; M. M. Malcolm, vice-president; A. B. Abbott, secretary and treasurer; A. W. Hamilton, R. T. Hubbard, Jr., George Love, R. L. Carter, C. R. Summerfield and T. J. Davis.

**W. Va., Norwood.**—P. O. Kimball.—The Norfolk & Western Railway is reported building a four-mile branch from Norwood up Laurel Hollow, following the old line of the Norwood Lumber Co.'s tram line. C. S. Churchill, Roanoke, Va., is chief engineer.

**W. Va., Parkersburg.**—The Charleston, Parkersburg & Northern Railroad Co. has been chartered, with headquarters at 217 4th St., Parkersburg, to build the proposed railroad from Parkersburg to Charleston, W. Va., about 75 miles; capital stock authorized \$100,000; incorporators, Kenner B. Stephenson of Parkersburg, W. Va., and H. M. Fowler, E. R. Riddle, J. E. Fowler and A. H. Geiger of Washington, D. C.

## STREET RAILWAYS

**La., New Orleans.**—The New Orleans & Western Railway Co. It is reported, will begin work soon on an extension from Amensville to Westwego, about two miles. Only single track will be laid now, but provision is made for double track when required.

**N. C., Durham.**—R. H. Wright, president, and J. S. Carr are reported announcing the sale of control of the Durham Traction Co. to Henry L. Doherty & Co., 60 Wall St., New York. The company runs the street railway, electric lighting and ice business in Durham. R. L. Lindsey is manager. Improvements and extensions may be made.

**N. C., Greensboro.**—North Carolina Public Service Co. is quoted as announcing that the North Elm Street car line will be extended to Sunset Drive, giving near approach to the Greensboro Country Club.

**Tex., San Antonio.**—The San Antonio Traction Co., it is reported, will, with the Gas & Electric Co., spend this year \$300,000 for street railway and other improvements. E. Eysenbach is manager.

**W. Va., Charleston.**—The West Virginia Light & Traction Co. of Charleston, is just chartered, and among other enterprises may build and operate railways. Authorized capital stock, \$500,000. Incorporators, Angus

McDonald, O. P. Fitz Gerald, V. L. Black, L. G. Summerfield and John Wehrle, all of Charleston.

**W. Va., Grafton.**—The Grafton Traction Co., it is understood, will extend its lines as soon as the plans for merger of the Grafton Gas & Electric Co. are fulfilled. Extensions include a line to Prantytown. Col. John T. McGraw is president.

## MACHINERY, PROPOSALS AND SUPPLIES WANTED

**Manufacturers and others in need of machinery or supplies of any kind are requested to consult our advertising columns, and if they cannot find just what they wish, if they will send us particulars as to the kind of machinery or supplies needed we will make their wants known free of cost, and in this way secure the attention of manufacturers and dealers throughout the country. The Manufacturers Record has received during the week the following particulars as to machinery and supplies wanted.**

**Art Glass.**—Chairman building committee of Christian Church, Box 72, Macy, Ind.—Correspondence with manufacturers of art-glass windows, etc., for proposed edifice.

**Bank Fixtures, etc.**—Herbert L. Cain, 103 Main Street Bank Bldg., Richmond, Va.—Prices on bank fixtures and vault doors for Bank of Smithfield, Smithfield, Va.

**Baskets.**—See "Trucks, etc."

**Boilers.**—Everlasting Window Shade Co., J. W. Tatum, manager, Angler, N. C.—Prices on boilers.

**Bauxite.**—Chas. R. Fife Company, 624 Central National Bank Bldg., St. Louis, Mo.—Bauxite property or the product in carloads.

**Boilers.**—Valverde Planting & Manufacturing Co., Valverde, La.—Four 84x20 boilers with steel casing, Dutch oven setting, for bagasse; two 84x20 boilers with steel casings, set for oil or coal; also self-supporting stack for boiler.

**Brick Machinery, etc.**—James S. Hooper, 307 Morris Bldg., High Point, N. C.—Catalogues and prices on cement or sand-lime brick machinery; hand; capacity 3000 to 5000 blocks or bricks daily.

**Bridge Construction.**—Bids received by undersigned until April 5 for construction of steel bridge at Alken's Lake, Ala., on road from Bay Minette to Stockton; bids opened by Commissioners' Court April 8; plans and specifications with Judge of Probate, Baldwin county; \$250 certified check; John H. Taylor, Commissioner of Second District.

**Bridge Construction.**—Bids received at office of W. S. O'Neal, clerk of Pittsburg county, McAlester, Okla., April 19 and opened April 21 for erecting bridges: Bridge No. 39, over North Boggy Creek, 8 miles from Kiowa, 50-foot steel span and 47-foot wood approach; one pier, concrete, with wing walls, other pier tubular; same bridge, No. 39, same location, 60-foot span, reinforced concrete spandrel, rib arch, with wing walls; same bridge, No. 39, same location, 50-foot span, concrete piers, with 47-foot approach. Bridge No. 40, over Coal Creek, 8 miles from McAlester, 124-foot 3-inch steel span and 109-foot wood approach, one pier concrete, with wing walls, other tubular; same bridge, No. 40, same location, double 70-foot span, reinforced concrete spandrel, rib arch, with wing walls; also same bridge, No. 40, same location, 124-foot 3-inch span, concrete piers, with 47-foot wood approach. Bridge No. 41, over Long Town Creek, near Bower, 75-foot steel span and 125-foot wood approach, piers tubular; same bridge, No. 41, same location, 70-foot span, reinforced concrete spandrel, rib arch, with wing walls; also same bridge, No. 41, same location, 75-foot wood span, concrete piers and 125-foot wood approaches; plans and specifications in clerk's office; certified check 10 per cent. amount each bid; P. S. Lester, chairman County Commissioners.

**Bridge Construction.**—G. A. Sherrill, Cheraw, S. C., invites architects and contractors to submit plans and estimates for construction of 125-foot steel bridge.

**Belting, Lumber, etc.**—Navy Department, Bureau of Supplies and Accounts, Washington, D. C., opens bids until April 8 for furnishing miscellaneous lot of double leather belting, 10,250 rubber gaskets, 1000 pounds soft iron flat-head rivets, and miscellaneous belt copper rivets without burrs and brass cotton pins, schedule 5279; 140,000 red brick, miscellaneous hot rolled or forged steel, 194,000 pounds soft bright steel, 256,000 pounds galvanized sheet steel and 231,300 pounds sheet zinc, schedule 5278; miscellaneous

lots cast-iron pipe and fittings and water pipe and gate valves, schedule 5273; delivery Navy-yard, Washington, D. C.; for copies of schedules apply to navy pay office nearest navy-yard; T. J. Cowie, Paymaster-General.

**Bridge Construction.**—Wilson County Bridge Commission, J. N. Adams, chairman, Lebanon, Tenn., opens bids April 7 for construction of two bridges; one concrete structure at Lebanon, 70 feet long and 60 feet wide; other of steel at Liberty, Tenn., 225 feet long; Professor Drane of Lebanon, engineer in charge.

**Building Materials.**—See "Art Glass."

**Building Materials.**—Allen W. Carter, Dillwyn, Va.—Prices on building materials.

**Building Materials, etc.**—Smith & Barthel, 305 Central Savings Bank & Trust Co. Bldg., Monroe, La.—Manufacturers' catalogues and samples of interest to architects.

**Building Materials.**—Methodist Episcopal Church South, Rev. Ira Bryce, pastor, Orange, Tex.—Prices on building materials, including brick and cement blocks and electrical equipment.

**Building Materials, etc.**—Brady & Black, Temple, Tex.—Prices on double hung metal window frames (constructed under supervision of National Board of Underwriters), roofings, metal ceilings, vault lights, skylights, tubular guard rails, window guards, galvanized cornice and tile.

**Building Materials.**—Corinth Methodist Episcopal Church, Rev. J. Elmer Hearn, pastor, Heathsville, Va.—Prices on building materials, including art-glass window.

**Building Material.**—Herbert L. Cain, 103 Main Street Bank Bldg., Richmond, Va.—Prices on art glass, stone front and marble wainscoting for bank building at Smithfield, Va.

**Building Materials.**—J. H. Watkins & Co., fourth floor Central Savings Bank & Trust Co. Bldg., Monroe, La.—Prices on building specialties; view to representation.

**Canning Machinery.**—Southern Products Co., E. M. Benson, president, Adel, Ga.—Prices on machinery and other equipment for canning plants.

**Cement, Gravel, etc.**—G. A. Chamblin, 55 S. Conception St., Mobile, Ala.—Prices on cement, gravel and sand.

**Cement Blocks.**—See "Building Materials."

**Chandeliers.**—Corinth Methodist Episcopal Church, Rev. J. Elmer Hearn, pastor, Heathsville, Va.—Prices on chandeliers.

**Church Furniture.**—Chairman building committee of Christian Church, Box 72, Macy, Ind.—Prices on church furniture.

**Clock.**—Herbert L. Cain, 103 Main Street Bank Bldg., Richmond, Va.—Prices on clock for bank building at Smithfield, Va.

**Concrete Dam.**—Proposals for construction of concrete masonry dam for Alexandria Water Co. of Alexandria, Va., received by David J. Howell & Son, engineers, Union Trust Bldg., Washington, D. C., until April 15; entire work one contract; \$5000 certified check; \$10,000 bond; location about six miles northwest of Alexandria; approximately 16,000 cubic yards earth and 1600 cubic yards rock excavation, 17,500 cubic yards concrete masonry and 1150 cubic yards rubble masonry; also gatehouse, pipe setting, gate valves, sluice gates, etc.; plans can be seen, and specifications, proposal forms, etc., obtained from engineers after April 1 on deposit of \$10. (Recently noted.)

**Coal.**—Office of Superintendent of City Gas Works, Richmond, Va. Proposals received until April 1 for furnishing for one year from May 1, 1913, with 15,000 net tons per annum, more or less, of best quality gas coal, and 3500 net tons per annum, more or less, of genuine New River or Pocahontas

steam coal; above material must conform with specifications (copies of which, also forms for tenders, may be procured at this office) and be satisfactory to superintendent, and delivered on C. & O. R. R. trestle at these works at such times and in such quantities as may be required, with all freight charges, trackage, etc., prepaid; successful bidder will be required to execute trust company's bond for \$10,000; certified check for \$500; W. P. Knowles, superintendent.

**Concrete Mixer.**—G. A. Chamblin, 55 S. Conception St., Mobile, Ala.—Prices on concrete mixer.

**Cooling Plant.**—See "Heating and Ventilating, etc."

**Croosoting Machinery.**—W. M. Shannon, Arcade Bldg., Columbia, S. C.—Addresses of manufacturers of apparatus for impregnating lumber with creosote, etc.

**Corn-mill Parts.**—John T. Wyatt, Route 3, Box 10, Salisbury, N. C.—Prices on band iron for banding millstones; mill picks and mill spindles; balance irons; driver iron; ink and ink boxes for millstones for grinding corn.

**Cranes.**—See "Foundry Equipment, etc."

**Crushers.**—Paul Stone Co., R. F. D. No. 8, Box 99, San Antonio, Tex.—Correspondence with manufacturers of roll crushers.

**Dam Construction.**—Adams Bros., R. F. D. No. 2, Cadiz, Ky., invite bids for construction of dam, 60 feet long, 15 feet high, 8-foot base and 5-foot top.

**Decorating.**—H. M. Magle, First National Bank Bldg., Waynesboro, Va.—Catalogues, etc., on decorating for \$6500 residence.

**Dredges.**—Southern Drainage & Construction Co., Kinston, N. C.—Prices and specifications on drag line steam dredges.

**Dump Wagons.**—Northern Construction Co., Elkhart, Ind.—Second-hand dump wagons; first-class condition.

**Electric Plant.**—Dr. S. C. Tatum, Center, Ala.—Small second-hand electric-plant equipment.

**Electric-light Plant.**—E. H. Hulsey, Galveston, Tex.—Prices on electric-light plant for \$125,000 theater, office and store building.

**Electric-light Plant Machinery, etc.**—See "Water-works and Electric-light Plant Machinery, etc." La, Lafayette.

**Electrical Equipment.**—See "Building Materials."

**Electrical Equipment, etc.**—Magnum Electric Fly Screen Co., R. F. Hayter, president, Mangum, Okla.—Small Bell transformers, box spark coils, 22 and 24-gauge copper-covered wire, porcelain and fiber-strip strips.

**Electrical Machinery, etc.**—Proposals received at office of General Purchasing Officer, Isthmian Canal Commission, Washington, D. C., until April 15, then publicly opened, for furnishing induction motors, auto starters or compensators, automatic oil switches, copper cable, journal bearings, brake-rod connection pins, steel keys for brake shoes, bolts for brake shoes, pig-iron, aluminum pig, ferro-silicon, ferro-manganese and lumber. Blanks and general information relating to this circular (No. 769) obtainable from this office and offices of assistant purchasing agents, 24 State St., New York; 614 Whitney-Central Bldg., New Orleans, and 1086 North Point St., San Francisco; also from United States Engineer offices in Seattle, Los Angeles, Baltimore, Philadelphia, Pittsburgh, Boston, Buffalo, Cleveland, Cincinnati, Chicago, St. Louis, Detroit, Milwaukee, St. Paul, Chattanooga, Louisville, Mobile and Galveston; Commercial Club, Kansas City; Chamber of Commerce, Quincy, and Commercial Club, Tacoma. F. C. Boggs, Major, Corps of Engineers, general purchasing officer.

**Electric Motors.**—E. L. Zimmerman, Box U, Tarpon Springs, Fla.—One-half horsepower and 2½-horse-power electric motors; alternating current, 110 volts; for printing plant.

**Elevators.**—Brady & Black, Temple, Tex.—Prices on 8x12-foot hand power and 8x5-foot sidewalk elevators.

**Fire-escapes.**—D. F. Fuquay, Daytona Beach, Fla.—Prices on iron fire-escapes.

**Foundry Equipment, etc.**—Norman-Lewis Foundry & Machine Co., Rusk, Tex.—Prices on foundry equipment, 30-foot traveling crane, ladles, molding machines and jib crane.

**Gas Engine.**—Everlasting Window Shade Co., Angler, N. C.—Prices on gas engine.

**Gas Producers and Engine.**—John G. Duncane Company, 308 W. Jackson Ave., Knoxville, Tenn.—Jobbers and dealers' prices on suction gas producers, with engine attached and with engine detached; also jobbers' prices on 75-horse plant.

**Grinding Plant.**—H. H. Guhl, Box 833, Richmond, Va.—Prices on lime grinding plant complete; state price and full information first letter.

**Heating Plant.**—Corinth Methodist Episcopal Church, Rev. J. Elmer Hearn, pastor, Heathsville, Va.—Prices on furnace.

**Heating Plant.**—Methodist Episcopal Church South, Rev. Ira Bryce, pastor, Orange, Tex.—Prices on steam or hot-air heating plant.

**Heating Plant.**—Brady & Black, Temple, Tex.—Prices on steam-heating plant.

**Heating Plant.**—H. M. Magle, First National Bank Bldg., Waynesboro, Va.—Catalogues, etc., on heating plant for \$6500 residence.

**Heating and Ventilating.**—E. H. Hulsey, Galveston, Tex.—Prices on ventilating and heating and cooling plant for \$125,000 theater, office and store building.

**Ice Machinery.**—Drew Oil Mills, J. W. Hall, superintendent, Monticello, Ark.—Prices on equipment for 24-ton ice plant.

**Lathes.**—American Metallic Packing Co., Lexington, Ky.—Second-hand engine lathes, 28 to 44-inch swing by 15 to 18-foot bed; good condition and complete. Give description, location and price.

**Lathes.**—John G. Duncan Company, 208 W. Jackson Ave., Knoxville, Tenn.—Circulars, cut and lowest dealers' prices on new and rebuilt engine lathes, 16-inch swing by 6 and 8-foot bed, hollow, single back gear; guaranteed; also prices on 9-inch swing screw-cutting lathes.

**Laundry Machinery.**—Newport Produce Co., Newport, Tenn.—Correspondence with manufacturers of laundry machinery.

**Laundry Machinery.**—E. W. Gaynor, 74 St. Michael St., Mobile, Ala.—Prices on first-class laundry equipment for delivery at Merida, Yucatan, Mexico.

**Lumber.**—Navy Department, Bureau of Supplies and Accounts, Washington, D. C., opens bids April 8 for furnishing 14,220 feet yellow pine; delivery Navy-yard, New Orleans, La.; for copies of schedule apply to navy pay office nearest navy-yard.

**Machine Tools.**—Thurman Vacuum Cleaner Co., 11th and Monroe Sts., St. Louis, Mo.—Prices on lathes, drill presses, shapers, milling machine, etc.

**Machine-shop Equipment.**—Appalachian Machine Works, R. H. Masters, manager, Appalachia, Va.—Lathes, drill press, four to six-horse-power gasoline engine, vulcanizer (rubber tires), grinders, shafting and pulleys.

**Mechanical Equipment.**—Subdepartment Office Inspector of Buildings, City Hall, Baltimore, Md. Proposals received by Board of Awards for additional mechanical equipment to be installed in new Polytechnic Institute Building; certified check to the amount of \$500; drawings and specifications seen at office of Inspector of Buildings on and after March 27; C. E. Stubbs, Inspector of Buildings.

**Mill Supplies.**—Everlasting Window Shade Co., Angler, N. C.—Prices on mill supplies.

**Mine Cars.**—Cahaba Central Coal Co., West Blocton, Ala.—Prices on mine cars.

**Mining Machinery.**—Leckie Collieries Co., Wm. Leckie, president, Welch, W. Va.—Open bids April 1 on 200-kilowatt generator, modern triples with shaking screens and picking tables; all equipment electrically driven; for operation Williamson, W. Va.

**Oil-mill Machinery.**—Due West Oil Mill, Due West, S. C.—Opens bids in April for linters, hullers, separating machinery, shaftings, pulleys, conveying machinery, etc.

**Paper and Paper-cutting Machinery, etc.**—Brown Patents Co., 45 Sycamore, Petersburg, Va.—Receiving bids on paper cutter, eyelet-setting machine and paper for manufacturing note books.

**Partitions.**—R. M. Briant, Hope, Ark.—Prices on rolling partitions for church.

**Paving.**—Office of Paving Commission, R. Keith Compton, chairman, Baltimore, Md.—Separate proposals, addressed to Board of Awards, care of City Register, received at City Hall until April 2 to grade, curb and pave on concrete base the following: Contract No. 32, vitrified block, 13,520 square yards, certified check \$500; Contract 53, granite block, 16,650 square yards, certified check \$1700; Contract 54, sheet asphalt, 3020 square yards; bituminous concrete, 2000 square yards; vitrified block, 2570 square yards; certified check \$500; approximate quantities; specifications and proposal sheets obtainable on application at office of Paving Commission, City Hall; deposit of \$5 required for set of specifications covering

each contract; plans and profiles on file with H. Kent McKay, chief engineer.

**Paving.**—Bids received by Commissioners of Public Works, Tampa, Fla., until April 1 for laying about 200,000 square yards of vitrified brick pavements, using either sand, cement or asphalt fillers; bids to be made on forms furnished by the board; specifications for above work can be obtained from office of City Engineer from this date; certified check for \$200; D. B. McKay, chairman; Allen Thomas, clerk.

**Paving, etc.**—City Council, Gadsden, Ala., receives bids until April 7 for 1334 square yards concrete sidewalk, 3000 linear feet 8-inch curb, 36-inch gutter, 200 linear feet 6-foot gutter, 200 cubic yards excavation and taking up of 15 trees; plans and specifications on file in office of Charles L. Marsh, City Engineer.

**Perfumers' Supplies, etc.**—Perry Chemical Co., 312 Granite Bldg., St. Louis, Mo.—Chemicals, opal glass boxes and perfumers' supplies, including essential oils.

**Phosphate Rock.**—Chas. R. Fife, Box 950, St. Louis, Mo.—Correspondence with owners of phosphate rock or pebbles.

**Piping, etc.**—Never-Fail Farm, George T. Pipe-organ Machinery.—R. M. Briant, Hope, Ark.—Prices on pipe-organ machinery.

Kearsley, secretary, Pineview, N. C.—Prices on 328 feet 10-inch piping, 96 10-inch ells, 32 10-inch eyes, 730 feet 12-inch piping, 60 12-inch ells and 20 12-inch eyes; piping and ells to be No. 24 gauge, cold-rolled steel sheets.

FOR the benefit of business concerns, engineers, contractors, machinery manufacturers, dealers and others who find it profitable to follow up daily the industrial, commercial, railroad and financial development of the South and Southwest as published in this Construction Department,

### We issue every Business Day in the Year THE DAILY BULLETIN

The construction news as published in the Daily Bulletin is invaluable to all business people who want to keep in daily touch with the organization of business enterprises of all kinds throughout the whole South. Unlimited possibilities for the creation of business, for securing contract work, for the sale of machinery and supplies of all kinds, for bond buyers and others, are to be found through a close following up of the news in the Daily Bulletin.

The Daily Bulletin is an exceptionally desirable advertising medium.

The subscription price is \$25.00 a year. Are you a subscriber to it, or an advertiser in it? If not, you are missing an opportunity for profitable business.

**Planer.**—Navy Department, Bureau of Supplies and Accounts, Washington, D. C., opens bids April 15 for furnishing reversing motor planer, schedule 5267; delivery Norfolk, Va.; for copies of schedule apply to navy pay office nearest navy-yard.

**Plumbing.**—H. M. Magle, First National Bank Bldg., Waynesboro, Va.—Catalogues, etc., on plumbing for \$6500 residence.

**Printing Machinery.**—Granville County Publishing Co., John W. Hester, secretary-treasurer, Oxford, N. C.—Receiving prices on printing machinery, cost within \$8000.

**Printing Machinery.**—Cyrus H. Smith-deal, Jefferson, N. C.—Proposals on equipment for weekly newspaper plant; new or second-hand.

**Pulpit Furniture.**—Corinth Methodist Episcopal Church, Rev. J. Elmer Hearn, pastor, Heathsville, Va.—Prices on pulpit furniture.

**Pulverizing Machinery.**—R. P. Camden, Parkersburg, W. Va.—Prices on all or any part of plant, including second-hand (Jeffrey or Universal preferred) crusher for pulverizing marl; four to eight tons per hour capacity; marl for agricultural purposes.

**Pump.**—G. A. Chamblin, 55 S. Conception St., Mobile, Ala., will need pump.

**Railway Construction, Material, etc.**—Kentucky Southwestern Electric Railway, Light & Power Co., F. M. Smith, gen-

eral manager, City National Bank Bldg., Paducah, Ky.—Will construct railway, etc., requiring following: Earthwork excavation, 889,140 cubic yards; embankment, 135,558 cubic yards; channel changes, 19,700 cubic yards; wooden trestles, 5200 linear feet; street or road crossings, 112; cattle guards, 145; clearing and grubbing, 127 acres; 25 barns and houses to be moved; 5219 linear feet 12-inch, 265 feet 18-inch, 2454 feet 24-inch, 1235 feet 36-inch, 480 feet 48-inch and 50 feet 72-inch drains; 119 miles of fencing; 58 miles telephone; 59 miles bonding; 6084 tons 70-pound rails; 1700 kegs spikes; 550 kegs bolts; 20,000 pairs splice bars; 13,000 rail braces; 140,500 ties and 59 miles overhead construction, poles and wire.

**Road Construction.**—Proposals received by John A. Tyson, Chancery Clerk, Noxubee county, Mississippi, at courthouse, Macon, Miss., until April 9 for building about five miles gravel and five miles sand-clay road in District 2; about 34,000 yards earth excavation and hauling, spreading and rolling of chert or gravel for surfacing and building of five miles sand-clay road; certified check 3 per cent. amount of bid; plans, specifications and blueprints on file at office of Chancery Clerk.

**Road Construction.**—Bids received in office of County Clerk at Port Laven, Tex., March 28 for construction of 30 miles of graveled surfaced highway in Road District No. 2; certified check for \$6750; plans and specifications may be seen at office of County Clerk; F. M. Dudgeon, County Judge.

Weldon, N. C.—Catalogues and prices on roofers' supplies, tinplate, galvanized and black, iron, metal tile and other patent roofing material.

**Roofing.**—W. H. Player, Olanta, S. C.—Prices on roofing.

**Roofing.**—S. C. McDaniel, Gadsden, Ala.—Prices on roofing.

**Safe, etc.**—Teter & Co., Little Rock, Ark.—Prices on safe, vault and other bank fixtures.

**Safe.**—A. W. Dowling Insurance & Realty Co., Frank A. Hampton, president, Rocky Mount, N. C.—Prices on safe.

**Sawmill.**—Robert E. Risley, 59 First National Bank Bldg., Davenport, Iowa.—New or second-hand portable sawmill outfit; quote price delivered Teague, Tex.

**Scales.**—W. H. Player, Olanta, S. C.—Prices on platform scales.

**Seating.**—R. M. Briant, Hope, Ark.—Prices on seating for \$2500 church building.

**Seating.**—L. E. Sears, Robertsdale, Ala.—Prices on seating for auditorium of church building and Sunday-school.

**Seating.**—Corinth Methodist Episcopal Church, Rev. J. Elmer Hearn, pastor, Heathsville, Va.—Prices on pews and chairs for auditorium and Sunday-school room.

**Sewer Construction.**—Proposals for construction of about 18,221 feet sewers and drains from 24 to 8 inches diameter, with appurtenances, and about 200 feet cast-iron pipe for creek crossings received by Executive Board, Charlotte, N. C., until April 2; proposals addressed to Executive Board and endorsed "Proposal for Sewers and Drains;" certified check 5 per cent. amount of bid; plans and specifications obtainable from office of City Engineer, Joseph Elrich; A. H. Wearn, City Clerk and Treasurer. (Bids received March 19 were rejected.)

**Sewer Construction.**—Bids opened by Commissioners of Clarksdale, Miss., April 1 for furnishing materials and constructing about 1120 feet of 15 to 24-inch vitrified pipe sewer, with necessary manholes, catch-basins and connections; also for furnishing 2200 linear feet of 4 to 24-inch vitrified pipe, 25 barrels Portland cement, manhole covers, etc.; plans and specifications obtainable at office of City Superintendent, Walter S. Bolo; certified check for \$100. Address bids to M. W. Purnell, City Clerk. M. J. Bouldin, Mayor and Street Commissioner.

**Sewer Construction.**—See "Water-works and Sewer Construction," Tutwiler, Miss.

**Sewer Construction.**—Proposals endorsed "Proposal for Constructing Miscellaneous Lateral Sewers," addressed to Board of Awards, received at office of City Register, City Hall, Baltimore, Md., until April 9 for constructing miscellaneous lateral sewers, as per plans at office of Calvin W. Hendrick, chief engineer Sewerage Commission; plans and specifications obtainable March 22 at office of Sewerage Commission, Charles England, chairman, 304 American Bldg.; charge of \$5 per set of specifications and blueprint; certified check \$500; approximate quantities, 6000 linear feet vitrified pipe sewer, 8 to 16 inches diameter, and 1500 linear feet vitrified pipe house connections.

**Sewers.**—City of Monticello, Ark., desires bids at once for perfection of sewerage purification system now in operation; contractor to convert system into one for which contractor will deposit bond; contract probably awarded April 4; E. B. Wells, chairman sewerage committee.

**Sheet Iron, etc.**—Proposals received at office of General Purchasing Officer, Ishmian Canal Commission, Washington, D. C., until April 12 for furnishing sheet iron or steel, wire cable, chain, Babcock metal, yellow metal, sheet brass, bronze bars, brass tubing, bronze wire cloth, nuts, cast-iron washers, nails, screws, tacks, cotter pins, shovels, hoes, grinders, tackle blocks, valves, belt lacing, emery cloth, sandpaper, sash cord, railway flags, mop heads, ships' felt, marine, paper clips, pins, rules, paper, line and beeswax; blanks and general information relating to this circular (No. 768) obtainable from this office and offices of assistant purchasing agents, 24 State St., New York; 614 Whitney-Central Bldg., New Orleans, and 1066 North Point St., San Francisco; also from United States Engineer offices in Seattle, Los Angeles, Baltimore, Philadelphia, Pittsburgh, Boston, Buffalo, Cleveland, Cincinnati, Chicago, St. Louis, Detroit, Milwaukee, St. Paul, Chattanooga, Mobile and Galveston; Commercial Club, Kansas City; Chamber of Commerce, Quincy, and Commercial Club, Tacoma. F. C. Boggs, Major, Corps of Engineers, United States of America.



**Tank.**—L. P. Steadman, Leesville, S. C.—Prices on small cypress water tank.

**Trucks, etc.**—W. H. Player, Olanita, S. C. Prices on tobacco baskets and trucks.

**Water-works Machinery, etc.**—City of Maryville, Mo., S. G. Gilliam, secretary Board of Public Works, will need one compound duplex condensing engine and two centrifugal engines; 500,000-gallon pressure filter; two 100-horse-power semi-water-tube boilers; heater; feed pump; 5280 feet eight-inch pipe.

**Water-works and Electric Plant Machinery, etc.**—Proposals received until April 9 for supplying and erecting machinery and equipment for improvements to water-works and electric-light plant at Lafayette, La., according to plans and specifications on file at office of A. R. Trahan, Mayor; copies of plans and specifications obtainable at office of Harold Raymond, engineer, New Orleans, La.

**Water-works and Sewer Construction.**—Proposals received by Mayor and Board of Aldermen, Tutwiler, Miss., until 9 A. M. March 4 were rejected, and new bids will be received April 15 for water-works and sanitary sewer construction; about two miles 4, 6 and 8-inch water pipe, 19 hydrants, 12 gate valves, steel tower and tank, receiving basin, combination gasoline engine and underwriters' fire pump and plain wood building; also one mile 8, 10 and 12-inch sewers, 8 manholes and 4 flush tanks; plans and specifications on file with J. L. Donald, clerk, and at office of consulting engineers, R. C. Huston & Co., Exchange Bldg., Memphis, Tenn.; contract let subject to sale of bonds; certified check not less than 5 per cent. amount of bid.

**Well-drilling Equipment, etc.**—Kingland Oil & Gas Co., C. E. King, vice-president, 427 American National Bank Bldg., Oklahoma City, Okla.—Prices on outfit for derrick and casing up to 14 inches; also wants experienced oil driller.

**Well Drilling, etc.**—Bishopville Ice & Fuel Co., J. S. Corbett, president, Bishopville, S. C.—Bids on "well to pump 100 gallons per minute on four-inch pipe; also bid on same pump to fit six-inch pipe put down about 200 feet and water will come in about 10 feet of surface.

**Well-drilling.**—Office Constructing Quartermaster, Fort Bliss, Tex. Proposals for sinking two deep wells received until April 7; information furnished on application; envelopes containing proposals should be endorsed "Proposals for Deep Wells," and addressed Constructing Quartermaster, Fort Bliss, Tex.

**Well-drilling Machinery.**—Verden Oil & Gas Co., A. B. Allen, secretary, Verden, Okla.—Opens proposals May 1 on complete outfit, heavy drill; no rotary.

**Wharf Construction.**—Proposals received at office of F. W. Storer, clerk of Council, 209 E. Bay St., Savannah, Ga., until April 1 for constructing public wharf and approach for same at Tybee Inlet, for use of town of Tybee. Specifications and drawings may be obtained or inspected during business hours. Robert P. Lovell, Mayor, Town of Tybee.

**Windows.**—R. M. Briant, Hope, Ark.—Prices on windows for church building.

**Woodworking Machinery.**—Wilmington Door & Lumber Co., Wilmington, N. C.—Woodworking machinery late in April.

**Woodworking Machinery.**—Coleman Churn-Operating Mechanism Manufacturing Co., W. H. Coleman, manager, 1335 Trimble St., Paducah, Ky.—Prices on machine for manufacturing wooden rods 40 inches long and three-quarters inch in diameter.

**Woodworking Machinery.**—See "Planer."

## FINANCIAL NEWS

The MANUFACTURERS RECORD invites information about Southern financial matters, items of news about new institutions, dividends declared, securities to be issued, openings for new banks, and general discussions of financial subjects bearing upon Southern matters.

### SOUTHERN COTTON-MILL STOCKS.

Quotations Furnished by William S. Glenn, Broker, Spartanburg, S. C., for Week Ending March 24.

	Bid.	Asked.
Abbeville Cotton Mills (S. C.)	100	100
Alken Mfg. Co. (S. C.)	45	45
American Spinning Co. (S. C.)	162	162
Anderson Cotton Mills (S. C.)	48	48

Anderson Cot. Mills (S. C.) Pfd.	100
Arcadia Mills (S. C.)	90
Arkwright Cotton Mills (S. C.)	99
Belton Mills (S. C.)	100
Brandon Mills (S. C.)	110
Brogan Mills (S. C.)	80
Chiquola Mfg. Co. (S. C.) Pfd.	160
Clinton Cotton Mills (S. C.)	99
Courtney Mfg. Co. (S. C.)	100
Dallas Mfg. Co. (S. C.)	99
D. E. Converse Co. (S. C.)	75
Drayton Mills (S. C.)	90
Eagle & Phenix Mills (Ga.)	106
Easley Cotton Mills (S. C.)	162
Enoree Mfg. Co. (S. C.)	25
Enoree Mfg. Co. (S. C.) Pfd.	100
Gaffney Mfg. Co. (S. C.)	65
Gainesville Cotton Mills (Ga.)	72
Glenwood Cotton Mills (S. C.)	100
Graniteville Mfg. Co. (S. C.)	135
Greenwood Cotton Mills (S. C.)	57
Grendel Mills (S. C.)	90
Hartsville Cotton Mill (S. C.)	175
Henrietta Mills (N. C.)	160
Inman Mills (S. C.)	100
King Mfg. Co. J. P. (Ga.)	85
Lancaster Cotton Mills (S. C.)	130
Lancaster Cot. Mills (S. C.) Pfd.	97
Langley Mfg. Co. (S. C.)	75
Laurens Mills (S. C.)	115
Limestone Mills (S. C.)	155
Lockhart Mills (S. C.)	50
Lockhart Mills (S. C.) Pfd.	95
Loray Cotton Mills (N. C.) Pfd.	90
Marlboro Cotton Mills (S. C.)	70
Mills Mfg. Co. (S. C.)	90
Molokoh Mfg. Co. (S. C.)	90
Monarch Cotton Mills (S. C.)	110
Newberry Cotton Mills (S. C.)	125
Ninety-Six Cotton Mills (S. C.)	130
Norris Cotton Mills (S. C.)	115
Orr Cotton Mills (S. C.)	90
Pacolet Mfg. Co. (S. C.)	99
Pacolet Mfg. Co. (S. C.) Pfd.	95
Parker Common.	20
Parker Pfd.	63
Pelzer Mfg. Co. (S. C.)	120
Poe Mfg. Co. F. W. (S. C.)	98
Saxon Mills (S. C.)	120
Spartan Mills (S. C.)	110
Trion Mfg. Co. (Ga.)	130
Tucapau Mills (S. C.)	310
Union-Buffalo (S. C.) 1st Pfd.	50
Union-Buffalo (S. C.) 2d Pfd.	5
Victor Mfg. Co. (S. C.)	110
Warren Mfg. Co. (S. C.)	80
Warren Mfg. Co. (S. C.) Pfd.	100
Washington Mills (Va.)	23
Washington Mills (Va.) Pfd.	110
Watts Mills (S. C.)	50
Whitney Mfg. Co. (S. C.)	105
Williamson Mills (S. C.)	120
Wiscasset Mills (N. C.)	135
Woodruff Cotton Mills (S. C.)	95
Woodside Cotton Mills (S. C.)	100

### FINANCIAL CORPORATIONS.

Ark., Little Rock.—Teter & Co. incorporated; capital \$200,000; surplus \$2,000, fully paid; E. T. Teter, president; B. F. Whitehill, vice-president; E. A. Teter, secretary, and J. M. Boath, treasurer. The company, which will conduct a private bank, will begin business April 1.

Fla., Bartow.—The Eureka Building and Loan Association has made application for charter; capital \$500,000. Directors will be A. B. Ferguson, president; J. M. Oglesby, vice-president; Benjamin Getzoff, secretary; T. W. Gary, treasurer; Wilson & Boswell, general counsel; E. C. Stuart, W. A. Whidden, Geo. H. Wright, S. M. Wilson and Edwin L. Mack.

Fla., Orlando.—A private bank is reported being organized with J. L. Giles as president.

Ga., Midville.—The Farmers and Merchants' Bank of Midville is chartered; capital \$25,000; incorporators, S. O. Jones, H. D. L. Southerland, O. H. Bigdon, T. H. Wall, T. W. Brooks and H. L. Smith, all of Midville, and L. R. Farmer of Louisville, and W. A. Law of Herndon.

Ky., Whitesburg.—A new bank is reported being organized by John C. C. Mayo of Paintsville, ex-Governor J. C. Beckham and County Judge John D. Fitzpatrick.

La., New Orleans.—Arrangements are reported being made to organize a title guarantee and abstract company with \$500,000 capital. Among those said to be interested are Felix J. Dreyfous and Dr. P. H. Saunders. S. H. Gehlman, Springfield, Ill.; M. H. Barker, Gulfport, Miss.; E. H. Lazarus, Edward Wisner and Willard & Eiseman of New Orleans. It is said the new company will purchase the records of the Louisiana Abstract & Title Co.

La., Shreveport.—Regarding the report that a large trust company with an authorized capital of \$1,000,000 and surplus of \$250,000 will be organized and affiliated with the Farmers' Loan & Trust Co. of New York, E. S. Marston, president of the Farmers' Loan & Trust Co., writes that he never heard of proposed organization of trust company at Shreveport.

Miss., McHenry.—The Citizens' Bank of McHenry has published its charter; capital \$25,000; business to begin when \$15,000 is paid in; incorporators, J. S. Adkison, P. E. Bond and L. B. Godard of McHenry, Nat. Owen of Gulfport and R. R. Perkins of Bay St. Louis.

Miss., Woodville.—The Commercial Bank expects to begin business April 15. The In-

terstate Trust & Banking Co. of New Orleans, the Bank of Slaughter, Slaughter, La., and the First National Bank of Jackson, Miss., are interested. The directors are J. B. Sterling, Jackson, Miss.; A. A. Wren, Slaughter, La.; P. M. Lamberton, New Orleans; L. J. Lewis, D. S. Wallace, Ake Cohen, A. W. McKeithen, Woodville, Miss. Officers, Mr. Lewis, president; J. B. Sterling, vice-president; cashier not named yet. Offices will be in the old Citizens' Bank Bldg.

N. C., Rocky Mount.—The A. W. Dowding Insurance & Realty Co. incorporated; authorized capital \$50,000, with \$7000 paid in; directors, Frank A. Hampton, president; Ben B. Arrington, vice-president, and A. W. Dowding, secretary and treasurer. Business began March 24.

N. C., Walkertown.—A new bank is organized with the following directors: J. J. Leight, T. A. Crews, J. C. Hammock, E. M. Leight, C. W. Jones, Henry Barrow and James Lewis.

Okla., Blair.—The First National Bank of Blair, to succeed the Citizens' State Bank of Blair, has made application to organize; capital \$25,000.

Okla., Henryetta.—The Miners' National Bank of Henryetta, capital \$25,000, is chartered; John Smith, president; J. W. Kincaid, cashier.

Okla., Henryetta.—The Guaranty State Bank is reported organized with \$25,000 capital and expects to begin business soon. M. G. Haskell of Muskogee is the promoter.

S. C., Anderson.—The Dime Savings Bank has been granted a commission; capital \$25,000; petitioners, Jas. H. Craig, A. S. Farmer, John W. Linley, E. R. Chapman, S. Rhett Parker and Leon L. Rice.

S. C., Cheraw.—The Cheraw Insurance & Trust Co., recently chartered with \$12,000 capital, has begun business; E. H. Duval, president; L. M. Evans, vice-president; J. H. Wells, secretary, treasurer and manager.

S. C., Greenwood.—The Citizens' Trust Co. of Greenwood has been granted a commission; capital \$50,000; petitioners, Jas. W. Medlock, W. A. Williams, J. S. Bailey and W. B. Bailey.

Tenn., Chattanooga.—The St. Elmo Bank & Trust Co. of Chattanooga, organized with \$10,000 capital and \$1000 surplus, has purchased the business of St. Elmo Branch Avenue Bank & Trust Co. Z. C. Patton, Jr., is president; J. A. Patton and J. R. Huff, vice-presidents; J. L. Lindsey, cashier. Business is to begin immediately.

Tenn., Reane.—The Bank of Reane is chartered; capital \$10,000; incorporators, A. Oliver, Whaley Shaver, J. W. Caplener, W. S. Bradley and T. Williams.

Tex., El Paso.—The Security Trust & Savings Co. is chartered; capital \$100,000. Incorporators, U. C. Henderson, W. L. Gaines, J. Harry Henderson and others.

Tex., Georgetown.—The Commercial Club is reported interested in the organization of a new building and loan association.

Tex., Greenville.—The Mutual Building and Loan Association will make application for charter; capital to begin with \$50,000; directors, L. A. Clark, S. B. Perkins, Will H. Camp, J. A. Phillips, F. R. Newman, George A. Pfaffle, Duke W. Harrison, C. A. Fagg, O. B. Hopkins, D. C. Mead, E. H. Jones, A. R. Holmes and G. L. Rutherford. The company expects to begin business as soon as the charter is secured.

Tex., Big Sandy.—The Farmers' State Bank, capital \$15,000, is incorporated by J. M. Mings, C. M. Smith and J. A. Vaughan.

Tex., Midlothian.—The Farmers' Guarantee State Bank of Midlothian is organized with \$20,000 capital. Officers, D. C. Smith, president; T. J. Dorsett, vice-president; J. S. McElowney, cashier; Walter S. Lewis, bookkeeper. Directors, J. P. Sewell, T. C. Perry, J. I. Lovett, W. G. Abernathy, G. W. Jenkins, G. W. Davis. It is expected that the new bank will begin business May 1.

Tex., Sealy.—The Farmers' National Bank is approved; capital \$25,000.

Tex., Richmond.—The First National Bank of Richmond, capital \$50,000, is chartered; J. R. Farmer, president, and E. G. Wessendorff, cashier.

Va., Brownsburg.—The Bank of Brownsburg incorporated, capital \$12,000, expects to begin business May 1 with the following directors: Rufus L. Patterson, president; Thomas S. Rees, vice-president; L. L. Arehart, H. W. McLaughlin, W. G. Reed, W. P. Whipple, W. T. Hutcheson, S. M. Huffman, P. M. Penick, W. A. East, J. R. Brown, D. J. Whipple, B. F. McClung, Jr., and J. W. Culton.

Va., Petersburg.—William H. Talley & Sons of Petersburg have been granted a charter; capital \$10,000 to \$25,000. Directors, W. H. Talley, president; J. C. Talley, secretary, and F. H. Talley. The company will do a general insurance business.

### NEW SECURITIES.

Ala., Alleeville.—City has voted \$11,000 of water-works plant bonds.

Ala., Cullman.—Cullman county has voted \$20,000 of good-roads bonds. J. N. Buell is president Cullman County Good Roads Association.

Ala., Fort Payne.—City proposes to issue \$10,000 of school bonds.

Ala., Girard.—The City Council has under consideration the question of issuing \$45,000 of bonds for water-works and electric-light system.

Ala., Hurtsboro.—Reported that city will on May 1 offer for sale the \$14,000 of electric light and sewer bonds.

Ala., Mobile.—It is proposed to hold an election to vote on school bonds. S. P. Gailard is president Board of Education.

Ala., Ronoke.—May 1 an election is to be held to vote on \$200,000 of electric-light plant and \$20,000 of sewerage system bonds.

Ala., Selma.—The citizens of Selma have purchased at par \$35,000 of 5 per cent. 25-year high-school bonds; denomination \$100, \$500 and \$1000; dated February 15, 1913.

Ark., Pocahontas.—Lesser-Goldman Cotton Co., St. Louis, Mo., has purchased at par \$55,000 of 5-25-year bonds of Running Lake Drainage District.

Ark., Sulphur Springs.—City is reported to have sold \$25,000 of electric-light and water-works system bonds.

Fla., Fort Myers.—City has voted \$60,000 of municipal improvement bonds. Menendez Johnson, W. J. Odom and Guy B. Reynolds, bond trustees.

Fla., Gulfport.—The Hanchett Bond Co., Chicago, Ill., has purchased, at par with accrued interest, \$10,000 of municipal improvement bonds; S. J. Webb is City Clerk.

Fla., Miami.—An election is to be held in April or May to vote on \$170,000 of 5 per cent. 5-29-year fire, sanitation, hospital, park, sewer and street bonds; denomination \$1000; dated June 10, 1913. Address J. W. Watson.

Fla., Orlando.—The \$200,000 of 5½ per cent. 30-year bonds of road and bridge district No. 1, Orange county, purchased on March 4 by Mayer, Deppe & Walter, Cincinnati, O., at \$125 premium, are dated January 1, 1913; denomination \$1000; M. F. Robinson, A. T. Rossetter and P. M. Elder, bond trustees.

Fla., Orlando.—Application is to be made to the Legislature for authority to issue \$100,000 of street-improvement bonds.

Fla., Plant City.—Voted: \$35,000 of sewerage, \$5000 of drainage and \$35,000 of paving bonds.

Ga., Albany.—Steps are being taken to call an election to vote on \$75,000 of school bonds.

Ga., Columbus.—Election will be held in July to vote on \$60,000 of hospital bonds. L. H. Chappell, Mayor.

Ga., Guyton.—April 15 an election is to be held to vote on \$10,000 of water-works and \$5000 of electric-light bonds.

Ga., Statesboro.—H. C. Speer & Sons Co., Chicago, purchased on March 10 \$54,000 of 5 per cent. 30-year sewer bonds; dated January 1, 1913. S. J. Crouch is Mayor.

Ga., St. Marys.—The \$10,000 of school bonds voted March 12 are 5 per cent.; denomination \$500; dated 1913 and maturing beginning 10 years after date. Address J. F. Hughes.

Ga., Washington.—Stacy & Braun of Cincinnati, O., have been awarded at par and accrued interest \$30,000 of paving bonds.

Ky., Elkton.—The election to vote on \$150,000 of Todd county road bonds will be held April 12. Lucian Lindsey is sheriff of Todd county.

Ky., Fulton.—A Chicago syndicate is reported to have purchased \$10,000 of street-improvement bonds.

Md., Frederick.—Bids will be received until noon May 1 for \$25,000 of 4½ per cent. 15-30-year Frederick county school bonds; denomination \$500. Address County Commissioners, Lincoln G. Dinterman, president.

[For Additional Financial News, See Page 76.]

**Merchants-Mechanics National Bank**

South and Water Sts., BALTIMORE, MD.

DOUGLAS H. THOMAS, President  
JNO. B. RAMSAY, V.-P. and Chm. Bd. of Dir.  
WM. INGLE, Vice-President.  
JOHN B. H. DUNN, Cashier.Capital \$2,000,000 Deposits \$21,670,000  
Surplus and Profits \$2,175,000

Accounts of Banks, Bankers, Corporations and Individuals solicited.

We invite correspondence.

**The First National Bank**

OF KEY WEST, FLA.

United States Depository and Disbursing Agent  
Capital - - - \$100,000  
Surplus and Undivided Profits - - - 40,000A general banking business transacted.  
Special attention given to collections.**INVESTMENT SECURITIES**Southern Stocks and Bonds  
Municipal and Corporation  
Cotton Mill Stock a Specialty

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**JOHN NUVEEN & CO.**First National Bank Building  
CHICAGOWe purchase SCHOOL, COUNTY and MUNICIPAL BONDS. Southern Municipal Bonds a Specialty.  
Write us if you have bonds for sale.**Delaware Trust Company**

WILMINGTON, DELAWARE

INCORPORATING under broad, liberal, safe and stable Delaware laws. A fully equipped department for proper organization and registration of corporations.

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462 F Street, N. W. Washington, D. C.

H. B. Wilcox, Pres. Blanchard Randall, V.-Pres.  
Wm. S. Hammond, Cashier.  
Sam'l W. Tschudi, A. Cash. R. E. Bolling, A. Cash.**The First National Bank**

17 South St., Baltimore, Md.

Capital - - - \$1,000,000  
Surplus and Net Profits - - - 400,000  
Deposits - - - 6,500,000

Especially well equipped to handle the business of Southern Banks, Corporations, and Individuals and Manufacturers. We cordially invite correspondence and interviews.

**The National Exchange Bank**

OF BALTIMORE, MD.

Hopkins Place, German and Liberty Streets  
Capital, \$1,000,000

July 15th, 1908, Surplus and Profits, \$671,631.60

OFFICERS

WALDO NEWCOMER, President.  
SUMMERFIELD BALLOVIN, Vice-Pres.  
R. VINTON LANSDALE, Cashier.  
C. G. MORGAN, Asst. Cashier.

Accounts of Mercantile Firms, Corporations, Banks Bankers and Individuals invited.

SURETY BONDS

**Fidelity & Deposit Co.**

OF MARYLAND

Home Office, - - BALTIMORE, MD.

Total Assets Dec. 31, 1911,

\$8,133,000.57

Pioneer Surety Co. of the South.

Becomes Surety on bonds of every description.

AGENTS IN ALL PRINCIPAL CITIES

Harry Nicodemus, Edwin Warfield,  
Sec'y and Treas. President**Southern Steam Railroad Securities**

DEALT IN

**F. J. LISMAN & CO.**

Specialists in Steam R. R. Securities

Members New York Stock Exchange

30 Broad Street NEW YORK

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Tribune Building, NEW YORK, N. Y.Negotiations, Investigations, Settlements,  
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—ORGANIZED—REPRESENTED—

LAW &amp; FORMS FREE

DELAWARE INCORPORATORS TRUST CO.

EQUITABLE BUILDING, WILMINGTON, DEL.

**WE BUY** City, County, School and Drainage BONDS from municipalities and contractors.**THE TILLOTSON & WOLCOTT COMPANY**  
CLEVELAND, OHIO**To Manufacturers and Capitalists**

Contemplating the Establishment of Industrial Enterprises

Attention is called to the exceptionally favorable location of

**NEWPORT NEWS, VA.**

on Hampton Roads, fifteen miles from the sea. Deep water, railway and sea transportation facilities unrivaled. Climate salubrious. Apply to

W. B. LIVEZEY, President

OLD DOMINION LAND COMPANY  
NEWPORT NEWS, VA.**Municipal Bonds Purchased**

Correspondence invited from Investors wishing to sell their holdings of seasoned marketable Municipal Bonds, and from municipal officials and contractors in connection with entire new issues.

**N. W. HALSEY & CO.**

49 Wall Street, New York

PHILADELPHIA

CHICAGO

SAN FRANCISCO

**Assets Realization Company**

CAPITAL AND SURPLUS \$11,000,000

Ass'ts in reorganization of essentially sound but over-extended enterprises.

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ADVERTISE YOUR BOND ISSUE

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WEEKLY—\$2.00 A YEAR

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From Municipalities and Contractors. Write us if you have entire bond issues for sale.

**SEASONGOOD & MAYER**  
CINCINNATI, OHIO**WE BUY City, County, School and Drainage BONDS**

FROM MUNICIPALITIES OR CONTRACTORS

We are in position to pay HIGHEST PRICES. Write or wire us your offerings.

**THE NEW FIRST NATIONAL BANK,** Assets, \$6,000,000 Columbus, Ohio**Freight Brokers—Forwarding Agents**

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CHARLES L. HEHL, C. P. A., President

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ERNEST E. WOODEN, C. P. A., Secretary

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STATE, CITY AND CORPORATION FINANCING

Entire Issues Bought and Sold

**Mercantile Trust & Deposit Company**  
OF BALTIMORECapital - - - - \$1,500,000  
Surplus - - - - \$3,000,000Thoroughly organized to exercise all Banking and Trust Company functions.  
Correspondent for Banks and Trust Companies.

A. H. S. POST, - President



Further particulars will be found in the advertising columns.

Miss., Charleston.—Notice is given of proposal to issue \$250,000 of 6 per cent. 40-year bonds for purpose of building a county jail at Charleston, in the First Judicial District of Tallahatchie County, and for building bridges. W. D. Brown is clerk.

Miss., Pascagoula.—Reported that Jackson county will soon offer for sale \$30,000 of road bonds of District No. 4.

Miss., Port Gibson.—Bids will be received until 2 P. M. April 7 for \$25,000 of general refunding, \$15,000 of road refunding and \$10,000 of road construction 5 per cent. 20-year Claiborne county bonds. B. H. Morehead is Chancery Clerk.

Miss., Yazoo City.—The \$65,000 of railroad bonds which the city proposes to issue will bear 5 per cent. and run 20 years; denomination \$500. T. H. Campbell, Jr., is Mayor and H. W. McCormick is City Clerk.

Mo., Galena.—March 29 an election is to be held to vote on \$25,000 of Stone county courthouse bonds.

Mo., Kansas City.—The Title & Savings Trust Co. of Kansas City was awarded at 100.50 the \$25,162.57 of 6 per cent. 1-10-year park fund certificates.

Mo., Rosedale.—April 1 an election is to be held. It is reported, to vote on \$28,000 of high school bonds.

Mo., St. Louis.—The Legislature has passed a bill authorizing the city to become indebted to the extent of \$30,000 for construction of a municipal subway.

N. C., Asheville.—Bids will be received until noon April 1 for \$30,000 of 5 per cent. 30-year funding bonds; dated March 1, 1913; maturity March 1, 1943. J. E. Rankin is Mayor.

N. C., Charlotte.—It is proposed to hold an election within the next 60 or 90 days to vote on \$150,000 of municipal bonds for schools and for increasing income of the Carnegie Library.

N. C., Hendersonville.—Hendersonville and Hoopers Creek township, Henderson county, propose to issue \$50,000 and \$20,000, respectively, for building good roads.

N. C., Newbern.—It is proposed to hold an election to vote on \$40,000 of school bonds.

N. C., Oxford.—The election to vote on \$20,000 of 5 per cent. school district bonds to pay for school building already erected will be held March 29. Address W. Z. Mitchell.

N. C., Rutherfordton.—April 23 an election will be held in Rutherford county to vote on \$250,000 of good roads bonds.

N. C., Troy.—The election to vote on \$25,000 of city and graded school district bonds is called for April 7.

N. C., Winston-Salem.—The Security Trust Co. of Spartanburg is reported to have purchased \$150,000 of 5 per cent. 20-year funding bonds at a premium of \$407.50.

Okla., Bristow.—Voted: \$25,000 of sewer, \$25,000 of electric light and \$20,000 of park bonds. Defeated: \$10,000 of water plant reconstruction bonds.

Okla., Tahlequah.—Cherokee county has voted \$70,000 of bonds for the purchase of both the old Cherokee capitol building and the former Cherokee penitentiary, and will convert the properties to use of the county.

Okla., Tulsa.—The Exchange National Bank is reported to have purchased the \$100,000 of convention-hall, \$40,000 of park, \$10,000 of market-place and \$7000 of library bonds at par and accrued interest. F. M. Wooden is Mayor.

S. C., Bishopville.—Lynchburg School District No. 13, Lee county, is offering for sale \$10,000 of 20-year bonds; interest 5½ and 6 per cent. T. N. Griffin is chairman. Further particulars will be found in the advertising columns.

S. C., Camden.—Voted: \$125,000 of municipal water and light plant bonds. The \$90,000 of bonds voted several months ago have been declared invalid.

S. C., Columbia.—An election is to be held in Richland county April 1 to vote on \$50,000 of 5 per cent. 20-year jail bonds. Walter T. Green is clerk County Commissioners.

S. C., Gaffney.—Bids will be received until noon April 15 for \$47,500 of Cherokee county 4½ per cent. 20-year bonds.

S. C., Lamar.—Town has voted \$7000 of

bonds to aid in purchasing right of way for the South Carolina Western Railroad.

S. C., Orangeburg.—A special election is to be held to vote on \$60,000 of water, light and power plant bonds.

S. C., Yorkville.—The People's National Bank has been awarded \$30,000 of 5½ per cent. York county bridge-building bonds.

Tenn., Alamo.—April 8 an election will be held to vote on \$12,000 of 5½ per cent. school building bonds; denomination \$500. Address The Mayor. R. L. Conyers is Clerk.

Tenn., Camden.—Reported defeated: \$20,000 of 4½ per cent. 20-30-year Benton county road bonds.

Tenn., Clarksville.—Judge C. W. Tyler opened bids March 22 for \$75,000 of 30-year Montgomery county floating debt bonds; denomination \$500.

Tenn., Dresden.—April 24 an election will be held to vote on \$12,000 of electric light and \$15,000 of water-works bonds.

Tenn., Memphis.—The Shelby County School Board is seeking authority to issue \$200,000 of school-building bonds.

Tenn., Memphis.—Steps are reported being taken to place on the market \$150,000 of street, \$200,000 of emergency reservoir, \$100,000 of lighting bonds. Address finance committee.

Tenn., Memphis.—Shelby county is authorized by the Legislature to issue \$25,000 of jail bonds; also \$100,000 of bonds to take care of deficit in roads, turnpike and bridge departments.

Tenn., Nashville.—Bids will be received until noon April 28 for \$200,000 of emergency repair and \$100,000 of electric-light extension 20-year bonds and \$150,000 of 30-year street-improvement bonds; interest 4½ per cent.; dated March 1, 1913; denomination \$1000. Wm. L. Murray is City Recorder.

Tex., Allenfarm.—Voted: \$10,000 of levee construction bonds.

Tex., Anahuac.—Commissioners of Precinct No. 4, Chambers county, has voted \$100,000 of road bonds.

Tex., Angleton.—April 15 an election is to be held to vote on \$15,000 of school-building bonds.

Tex., Austin.—The Attorney-General has approved the following securities: City of Longview, street improvement, \$60,000 40-20s 5 per cent.; Leggett Independent school district, \$2000 20-10s. 5 per cent.; Reagan Independent school district, \$13,000 40-20s 5 per cent.; Atascosa county common school district No. 1, \$16,000 30-12s 5 per cent.; Houston county common school district No. 9, \$600; Smiley Independent school district, \$10,000 40-10s 5 per cent.; Camp county common school district No. 9, \$2500 20-10s 5 per cent.

Tex., Boerne.—Reported defeated: Road bonds of Commissioners' Precinct No. 1, Kendall county.

Tex., Cameron.—An election is to be held in Justice Precinct No. 1, Milam county, to vote on \$150,000 of road bonds.

Tex., Crystal City.—The \$6500 of 6 per cent. 10-10-year street-improvement bonds offered March 6 were awarded to John H. Wood at 101.

Tex., Deport.—City will vote on bonds for modern fire-fighting apparatus.

Tex., Dublin.—Dublin Independent School District is offering for sale \$44,000 of 5 per cent. 10-40-year bonds; denomination \$1000. J. W. Dunlap is secretary.

Tex., Mineola.—The \$175,000 of 5 per cent. independent school district bonds voted March 11 will be placed on the market as soon as approved; denomination \$500; dated April 1; maturity April 1, 1953. Address P. E. Wallace.

Tex., Palestine.—Anderson county is reported offering for sale \$150,000 of 5 per cent. 10-40-year courthouse bonds.

Tex., Port Lavaca.—H. N. Swain of Dallas has purchased at par and accrued interest from April 10, 1913, less \$3000, the \$135,000 of road bonds of Road District No. 2, Calhoun county.

Tex., Sourlake.—Reported that \$5000 of school district bonds were recently voted.

Tex., Waco.—The \$245,000 of school, street and sanitary sewer bonds recently purchased by A. G. Edwards & Sons of St. Louis at 1.02 are 30-year 5 per cent.; denomination \$1000; dated January 1, 1913.

Tex., Wharton.—The Commonwealth Trust Co., Houston, Tex., has purchased \$50,000 of 5 per cent. 40-year bonds of Drainage District No. 2, Wharton county.

Va., Gate City.—A petition has been prepared asking the Supervisors of Scott County to order elections in the Johnson, Estville and Fulkerson Magisterial districts to vote on road bonds aggregating \$150,000.

Va., Norfolk.—An ordinance has been passed providing for special election to vote on \$500,000 of bonds for construction of bridge.

Va., Petersburg.—The \$100,000 of 4½ per cent. 40-year permanent improvement bonds offered March 20 have been sold, as follows: Petersburg Sinking Fund, \$97,000 at \$101, and to local parties, \$3000 at \$102.

Va., Spotsylvania.—Bids will be received until noon April 3 for \$20,000 of Berkeley district and \$20,000 of Livingston district, Spotsylvania county, 5 per cent. 5-30-year road bonds. Address A. H. Crismond, clerk. Further particulars will be found in the advertising columns.

W. Va., Huntington.—City proposes to issue about \$250,000 of bonds for additional paving and sewer work; also \$50,000 for building subway at 11th St.

W. Va., Parkersburg.—May 8 an election is to be held to vote on \$200,000 of street improvement and \$20,000 of school 4 per cent. 20-34-year bonds.

W. Va., Point Pleasant.—April 5 an election is to be held in Mason county to vote on \$10,000 of 4 per cent. 10-34-year school bonds; dated April 7, 1913; maturity April 7, 1923. R. A. Grinstead is president Board of Education.

#### FINANCIAL NOTES.

The Tennessee Bankers' Association will meet at Memphis April 16 and 17.

The Texas Bankers' Association will hold its annual meeting at Dallas, Tex., May 13, 14 and 15.

The East Alabama National Bank, Eufaula, Ala., has increased its capital from \$75,000 to \$100,000.

The First State Bank of Honey Grove has amended its charter increasing its capital from \$85,000 to \$125,000.

The American Bank & Trust Co. of Rome, Ga., is reorganized as the State Bank of Rome. Felix Corput is president.

The Farmers & Merchants' Bank of Hen-

derson, N. C., has amended its charter, increasing its capital from \$25,000 to \$50,000. Robert J. Gill is president.

The State Bank of Maryland, at Baltimore, has opened a new branch at Eastern Ave. and 3d St., Highlandtown, Md. William Woodward Cloud is president.

The Bank of Normangee, at Normangee, Tex., is reported to have changed its name to the First State Bank of Normangee and increased its capital from \$15,000 to \$50,000.

The Maryland Life Insurance Co. of Baltimore, Md., of which Douglas H. Rose is president, has taken over the life-insurance business of the Georgia Life Insurance Co. of Macon, Ga. The Georgia company will devote its work exclusively to casualty business.

Banks in Texas have been authorized to increase their capital as follows: Celina State Bank of Celina, from \$10,000 to \$25,000; First State Bank of Honey Grove, from \$55,000 to \$125,000; Arp Guaranty State Bank of Arp, from \$10,000 to \$20,000; First State Bank of Coolidge, from \$20,000 to \$40,000; First State Bank of Bonham, from \$75,000 to \$100,000; Guaranty State Bank of Tyler, from \$100,000 to \$200,000; Bankers' Trust Co. of Waco, from \$250,000 to \$500,000.

#### CENTERED IN LITTLE ROCK.

Undertakings for the Development of the City and State.

[Special Cor. Manufacturers Record.]

Little Rock, Ark., March 14.

Little Rock has a population of 45,910, not including the town of Argenta across the river; this is an increase of nearly one-fifth since 1900. It has 180 manufacturing enterprises. These are: Lumber and woodworking plants, 32; stone, marble, concrete, brick and lime, 13; iron, steel and tin, 27; patent medicines and mineral waters, 15; newspapers, periodicals and publishers, 9; cotton and cottonseed products, 16; saddlery, harness, wagons and buggies, 13; furniture and office fixtures, 5; boot and shoe factories, 2; mattress factories, 4; packing-houses, 2; miscellaneous enterprises, 44; railroad shops, 2 (Iron Mountain with 2400 employees, Rock Island with 600 employees, and monthly payroll of \$450,-

## Capital for Southern Industries Peabody, Houghteling & Co.

(Established 1865)

105 So. La Salle Street

CHICAGO, ILLINOIS

## IT'S POOR ECONOMY

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Are in a Class Alone. Write for Prices and Samples.

**J. P. STEVENS ENGRAVING CO.**  
45 Whitehall St. ATLANTA, GA.

## Southern Securities

We finance Southern propositions of merit and negotiate entire first mortgage bond issues.

**J. M. DEWBERRY & CO.**

Investment Bankers

Brown-Marx Bldg. Birmingham, Ala.

#### SOUTHERN RAILWAY COMPANY

30 Church Street, New York, February 14, 1913. A DIVIDEND OF TWO AND ONE-HALF PER CENT. (2½%) has been declared on the PREFERRED STOCK of this Company, payable on Thursday, April 24, 1913, to stockholders of record at the close of business Saturday, March 23, 1913.

R. D. LANKFORD, Secretary.

23 Wall Street, New York, February 14, 1913. On April 24, 1913, the Voting Trustees for Preferred Stock Trust Certificates of the Southern Railway Company, WHICH HAVE ASSSENTED TO THE EXTENSION AGREEMENT OF AUGUST 27, 1902, will be prepared to distribute the above dividend of two and one-half per cent. (2½%) when received by them, among the parties entitled thereto, as same appear of record on their books at the close of business March 23, 1913. J. P. MORGAN & CO., Agents for Voting Trustees.

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(000). The estimated annual value of the manufactured products from these 180 plants, not including the two railroad shops, is \$12,000,000, and the estimated capital invested in them is \$11,000,000. The healthy growth of the city is indicated by an increase of \$33,000 in the receipts of the postoffice from \$230,000 the year before to \$263,000 in 1912. The finances of the city are solid with a capital in seventeen banks of \$2,500,000, surplus and profits of \$1,500,000, deposits of \$13,000,000 and clearances for 1912 of \$100,538,369.

Having raised \$200,000 for the purpose of helping to establish industries, the Industrial Commission of the city is now at work forwarding the raising of the fund of \$1,000,000 total to cover a period of ten years. The first year with \$200,000 was productive of so much good that there is no doubt in the minds of even the most conservative of the conservatives that Little Rock will be able to "make good," for, with a packing plant and warehouses that cost \$250,000 as fruit of the first year's work, they no longer dissent, but get quietly to work when the committees are called, and stay on the job until what they have in hand is accomplished or decided to be not feasible.

But the organization is not contenting itself merely with extending invitations to new enterprises. It is aggressive all along the line. It has secured material reductions in freight rates on fuel and raw materials, is carrying on a persistent fight for improving and opening the Arkansas River for freight transportation; it has undertaken a big campaign of publicity, in which several thousands of dollars will be spent intelligently, by which the world will be enlightened as to the advantages offered by Little Rock and

the State of which the city is the capital, and, the truth told, the many hurtful stories about Arkansas that have been disseminated through certain literary channels will be corrected and the world made to see and understand what the State really is, what the people really are and what they stand for.

Among other things of importance that are highly probable of realization for the upbuilding of Little Rock are the plans of the Little Rock & Hot Springs Interurban Railway Co. This will require the investment of at least \$2,000,000. Local capital has undertaken to raise \$500,000, and now there are \$50,000 cash in escrow toward the work.

At Cotter, in Baxter county, on White River, an unnavigable stream, and one that can never be made navigable, there is undeveloped fall equal to 20,000 horsepower, 100 miles from Little Rock. The Dixie Power Co. is organized with Walker V. Powell as president and many Arkansas investors to develop this water-power by building a dam 100 feet high and 1750 feet long at the point named. The plant will cost, it is estimated, at least \$1,500,000. Power may be furnished—beside to Little Rock—to Joplin, Mo.; Springfield, Fort Smith and to Memphis, Tenn.

The Garland Power & Development Co., organized about two years ago, has been taken over by the Little Rock Railway & Electric Co., and the water-power on the Ouachita River, in Garland county, about 45 miles from Little Rock, will be developed with a dam 147 feet high. The power development will be a minimum of 28,000, with possible development of 100,000. This project will cost about \$3,000,000, it is estimated.

Another piece of development that will ultimately work out for the greater upbuilding of Little Rock is that recently

undertaken by the Arkansas Colonizing Co., of which Rose E. Bennet is president and J. Ewell Black secretary-treasurer. This company has obtained control of 27,000 acres of land in one tract, comprised in which are 2400 acres heavily underlaid with coal and lignite, according to engineers' reports. The company is now building fifteen miles of a railroad that is proposed to extend at least 68 miles for the purpose of developing this coal and lignite property and bringing it to Little Rock. The road being built is standard gauge, and will be equipped with standard rolling stock and engines. The company proposes colonizing and developing its lands industrially and agriculturally.

C. F. DRAKE.

#### Cape Fear River Lights.

Louis H. Skinner, vice-president of the Builders' Supply Co. of Wilmington, N. C., to whom was recently awarded the contract for lights on the Cape Fear River between Wilmington and the bar, writes to the MANUFACTURERS RECORD:

"The work consists of 22 reinforced concrete structures set in place, upon each of which is to be erected an upper steel structure varying in height from 10 to 30 feet, and from which will be shown an acetylene light. This work is in addition to 10 lights previously constructed by me, and will complete the system adopted for the Cape Fear River from the city to the bar."

#### Interest in Lake Borgne Transportation.

Charles R. Dunn, one of the directors of the Alabama & New Orleans Transportation Co., which controls the Lake Borgne Canal, connecting Mississippi Sound and the Mississippi River, and is having built at its shipyard on the canal

16 self-propelling barges, writes to the MANUFACTURERS RECORD from Detroit, Mich.:

"I visited the plant of the company at the canal 10 days ago, and found that they are making splendid progress, and that the activities of the company are arousing considerable interest in New Orleans. Scarcely a day passes but one or more automobile parties visit the plant for the purpose of watching the work, and expressions are frequently heard as to the great benefit this undertaking will be to the city of New Orleans and the surrounding territory."

In our issue of February 27 Mr. Dunn was erroneously named as vice-president of the Alabama & New Orleans Transportation Co.

#### Virginia Farms Attract New York Buyer.

H. P. Wilson of New York has purchased the old historic Hollin Hall farm of 300 acres and the Mt. Hybla farm, immediately adjoining, of 53 acres, in Fairfax county, Virginia, about three miles from Alexandria. On Mt. Hybla, an elevation of 200 feet, which affords a magnificent view of the surrounding country and the sweep of the Potomac River from Washington to Mt. Vernon, as well as the view of the hills of Maryland, a modern residence will be erected, to be occupied as the country home of Mr. and Mrs. Wilson. Building operations will be started within the next few months. The farm will be operated after first-class modern methods, and is the largest farm in this vicinity located in such proximity to Washington. The purchase of these farms was concluded on behalf of Mr. Wilson by Frank Van Sant, his attorney, of Washington, and J. F. Jerman of Fairfax, Va., representing the sellers.

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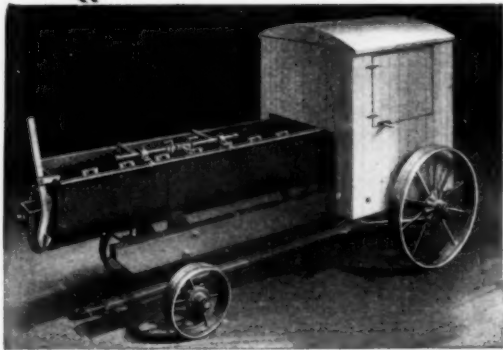
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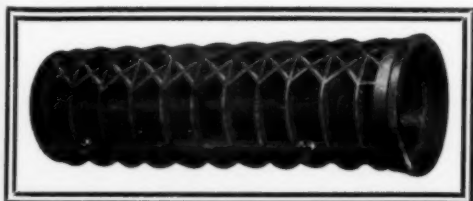
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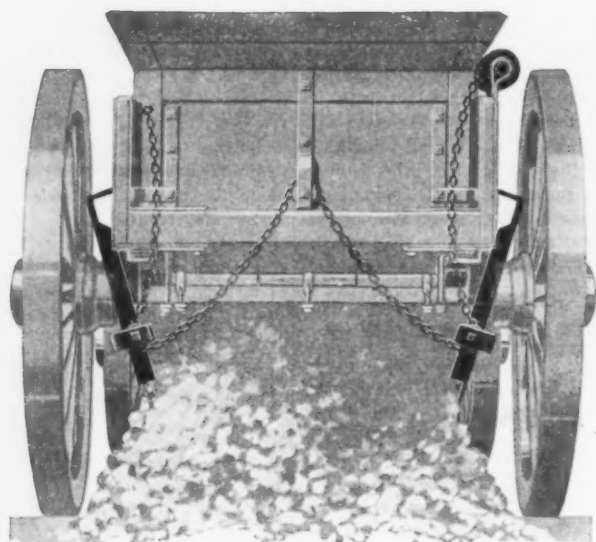
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Why the horse? Because it's short-coupled, and "short-coupled" is another way of saying "easy-running." It's light in weight, too.

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The shoveler smiles when the TROY drives up. It's low-down, and this has a world of meaning to the man who shovels ten long hours in the sun.

YOU? You'll swear by the TROY, because it is the only short-coupled wagon you can get that is full capacity and has plenty of clearance when it dumps. You'll like it because you can use it anywhere, for hand-loading or steam shovel work. Buy one and you'll keep on buying TROYS, because they make you more money than any wagons you ever had on the job.

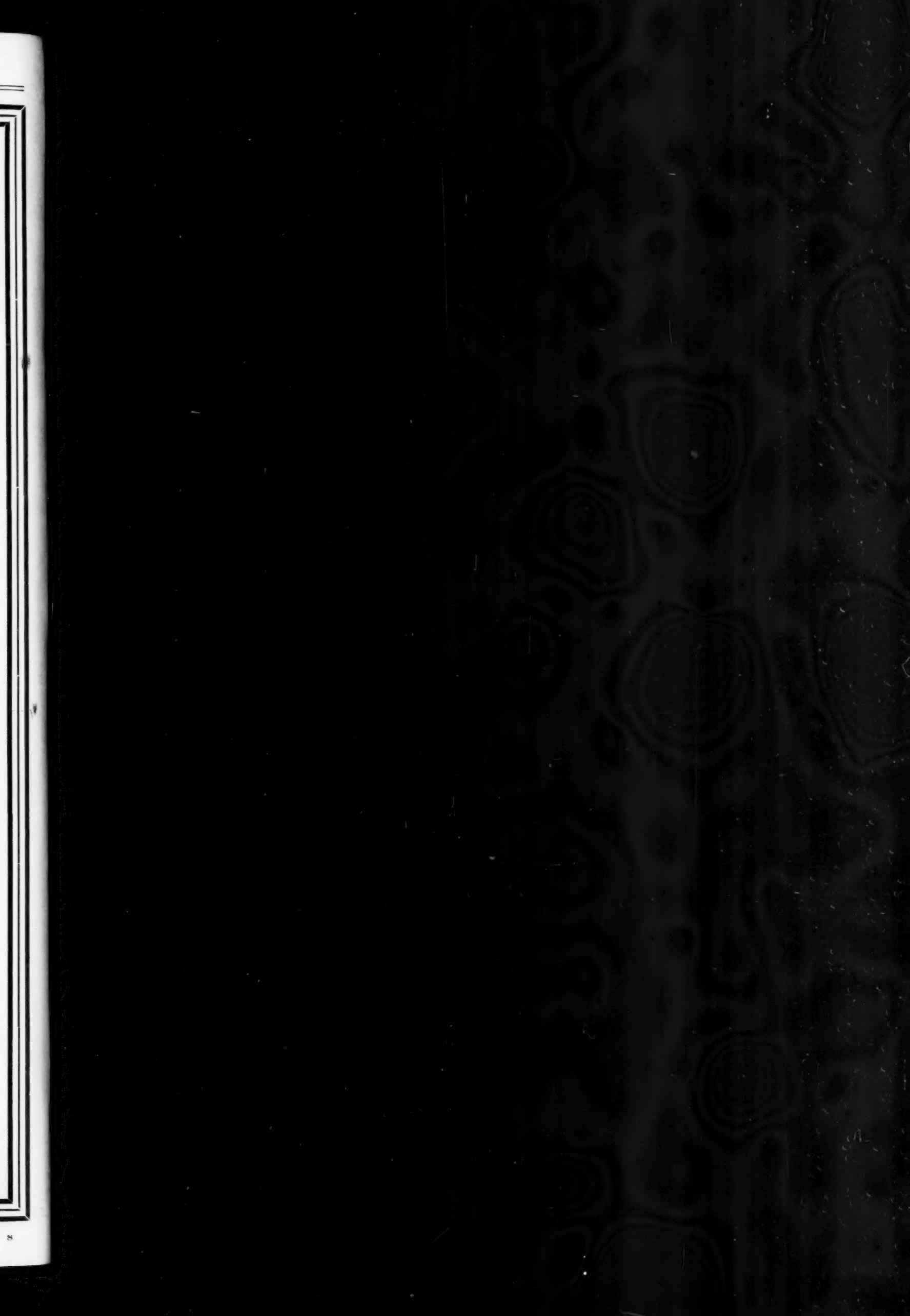
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BALTIMORE, MARCH 27, 1913

MANUFACTURERS RECORD



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# THE SOUTH: THE NATION'S GREATEST ASSET

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BALTIMORE, MARCH 27, 1913

## MANUFACTURERS RECORD

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BALTIMORE, MARCH 27, 1913

## The South: The Nation's Greatest Asset

**I**N February 22, 1912, the MANUFACTURERS RECORD published "Thirty Years of Southern Upbuilding," which covered the story of what the South had achieved in material upbuilding during the preceding thirty years. That publication commanded such wide attention throughout this country and Europe, and resulted in such general discussion as to the progress of the South, that it was soon seen that it would be necessary to issue a somewhat similar publication, but on a much broader and more comprehensive scale. The outcome of that decision is "The South: The Nation's Greatest Asset," issued as Part II of this date, Part I covering the regular work of the paper. The announcement some months ago of this proposed publication immediately attracted wide attention. Since then people everywhere have been asking:

Is it true that the South is the Nation's greatest asset?

Is it true that this section has been so marvelously endowed by nature as to make its development the most vital factor in the material advance of the Nation?

Is it true that geographical location and resources in soil, climate, minerals and timbers and water-powers, and in the very character of its people, make certain a development which will concentrate in the South the industrial and financial activities of America and give to this section a dominating position in the America destined to hold a dominating power in world affairs?

This publication answers these questions. We believe that every man who rises from a careful study of the facts presented here will realize that there is no other section in this or any other land known to mankind of such boundless potentialities, predestined by nature to be the focusing point of the world's greatest material activities and of the mightiest influences for shaping the world's affairs.

## Summons of the South to the World



THE SOUTH summons the world to share in the making of the wealth that is to come to it within the next generation. The call is emphatic, because no other equal area on the globe offers as great opportunities of many kinds for the productive and remunerative application to natural resources of the energies of mind, muscle and money; no other equal area has such a record as the South of a generation of achievement as a guaranty of greater attainments in the future.

Handicapped by conditions beyond its control for fifteen or twenty years, in which the rest of the country made extraordinary progress under the high-pressure influences of the opening of the era of organization of industry on a great scale, the South, once permitted to resume its farming, mining and manufacturing activities interrupted by war, has in the past thirty years advanced to a point beyond that reached by the whole country in 1880. With one-third of the total area of the United States and with a population less than two-thirds that of the country in that year, the South is actually far ahead of the United States of thirty years ago on many leading lines, and, in proportion to population, on practically every line.

Its invitation to the enterprise and financial and industrial instincts of the world is, therefore, grounded in tasks still to be accomplished gauged by what has already been done.

Since 1880 the South, the section of sixteen States, including Missouri and Oklahoma, has—

Mined 1,657,173,560 tons of coal, increasing its annual output from 7,002,254 tons, less than one-tenth of the country's production, to 131,970,000 tons, or nearly one-quarter of the total, representing a rate of advance of 1784.7 per cent.

Mined 126,529,584 tons of iron ore, increasing its annual output from 702,515 tons to 5,736,000 tons, or at the rate of 715.9 per cent.

Mined 41,400,000 tons of phosphate rock, increasing its annual output from 211,377 tons to 3,400,000 tons.

Produced 802,200,000 barrels of petroleum, increasing the flow from 179,000 barrels to 84,800,000 barrels.

Increased its annual production of natural gas from a few million cubic feet to 290,000,000,000 cubic feet, nearly 57 per cent. of the total output of the country.

Changed radically the status of the sulphur market of the world by exploiting beds of nearly pure sulphur and increasing the country's output from a few hundred tons to nearly 790,000 tons a year.

Brought within its limits the center of world production of lead and zinc.

Became the main source in this country of bauxite for the manufacture of aluminum.

Increased the annual value of its mineral production from \$18,226,000 to \$385,700,000, or at the rate of 2016.2 per cent., compared with a rate of 381.5 per cent. in the rest of the country.

Harvested 31,875,816,000 bushels of corn, wheat and oats, and advanced to an annual production of 1,404,200,000 bushels of grain.

Marketed 305,000,000 bales of cotton, more than doubling the annual crop of the staple, involving the production since 1880 of 120,000,000 tons of cottonseed.

Expanded its annual production of rice from 2,254,000 bushels to 24,000,000 bushels.

Increased up to 1910 its agricultural capital (its investments in lands, buildings, implements and livestock) from \$2,762,077,-



000 to \$10,961,866,000, or by \$8,199,789,000, equal to 296.5 per cent., while the rest of the country had an increase at the rate of 221.4 per cent., there being a like divergence in favor of the South between the rates of increase in the value of agricultural products.

Cut 371,184,000,000 feet of lumber, increasing the annual output from 3,800,000,000 feet to 20,000,000,000 feet, or at the rate of 426.3 per cent., and marking an advance in the annual value of forest products from \$75,215,000 to \$652,153,000, or at the rate of 767 per cent., against an increase in the rest of the country at the rate of only 74.4 per cent.

Made 66,222,888 tons of pig-iron, increasing the annual output from 448,978 tons to 3,054,980 tons, or at the rate of 580.4 per cent.

Made 145,940,905 tons of coke, increasing from 374,000 tons to 7,974,000 tons, or at the rate of 2032 per cent.

Added 11,172,000 spindles and 237,500 looms to the equipment of its cotton mills, the annual consumption of the staple by them increasing from 111,770,000 pounds, or less than 15 per cent. of the country's consumption, to 1,319,708,000 pounds, or more than half the country's consumption.

Practically created the cottonseed crushing industry, now having an annual output valued at about \$150,000,000.

Developed its Portland cement output into an industry of 11,000,000 barrels annually.

Multiplied its capital invested in manufacturing more than ten times, from \$330,000,000 to \$3,500,000,000, and the value of its manufactured products more than six times, from \$622,840,000 to \$3,900,000,000, or at the rate of 526 per cent., against an increase in such value in the rest of the country of 323.4 per cent.

These notable developments called for the building of 66,064 miles of railroad, an increase at the rate of 265.6 per cent., compared with 92,668 new mileage in the rest of the country and a rate of 135.5 per cent. increase.

They were reflected in exports to foreign lands to the value of \$13,629,518,000 sent through Southern ports and a sum equal to 77 per cent. of the value of foreign exports originating directly or indirectly in the South, the exports through Southern ports increasing at the rate of 190.5 per cent., while those through ports in the rest of the country increased at the rate of 151.3 per cent.

Results of the developments appear in a trebling of the estimated true value of all property in the South, indicated in the addition of \$1,918,633,000 to the aggregate resources of national banks, or an increase at the rate of 988.5 per cent.; of \$985,943,000 to the amount of individual deposits in such banks, or at the rate of 1348.3 per cent.; of \$1,146,396,000 to the amount of individual deposits in other financial institutions, or at the rate of 976.1 per cent., and of \$2,132,339,000 to the amount of individual deposits in all financial institutions, or at the rate of 1118.9 per cent.

These are striking facts of progress. But they are merely to be regarded as sample exhibits spurring to far greater achievements. They demonstrate what may be done with the assets of the South in making the most of that greatest asset of the Nation, the task to which the South summons the world.

It will not be long before the forests of the South will be the main reliance of the country for much of its lumber supply. These forests are to be handled wisely with that fact in view.

Population of the United States ever swelling in number at the rate of two million a year is making greater and greater demands upon agriculture. The South has less than half of its 384,117,000 acres of farm land under cultivation, and has at least 100,000,000 acres more that can be made highly productive with the water drawn from wet areas and the utilization of cut-over timber lands.

Its 500,000,000,000 tons of coal, its billions of tons of iron ore, its great sulphur deposits, its phosphate rock, its rock salt, its lead and zinc and copper, its marbles and other building stones, its clays and other minerals, are still to be turned into economic values.

Nearly 240 separate kinds of manufacturing industries are the skirmishers in the battle for industrial supremacy of the world.

Who is able to let the summons be unheeded?

## The Cover Design Tells the Story



HE cover design of "The South: The Nation's Greatest Asset" is in itself an interest-compelling presentation of the South. Resting on the solid foundation of mineral and agricultural and other resources, and held together by the keystone, Cotton, are the sixteen Southern States. Upon the arch thus formed, and dependent upon its solidity, rests the Nation's prosperity. That fact makes a study of this publication of vital importance to every business man whatever may be the character of his business or his profession, be he merchant, manufacturer, banker, railroad operator, educator, farmer or day laborer, wherever he may live, whether in the South, in the North, or West, or in foreign lands.

## The People Who Have Made This Issue Possible



S a man is known by the company he keeps, so a newspaper is known by the character of its advertising pages and the standing of the business concerns which are permitted to make their announcement through its columns. Clean advertising pages, free from any taint of the presence of undesirable business institutions, are just as essential to the reputation of a newspaper as are clean editorial and news pages. The MANUFACTURERS RECORD always aims to make admission to its advertising columns a proof of good character.

The MANUFACTURERS RECORD is willing to be judged by the character of the company it is keeping, and we point to the advertisements in this issue as illustrating its influence with the great business institutions, with the towns and cities, and railroads and individual concerns which are making the South. Their hearty co-operation has made possible the publication of this issue and its wide distribution throughout this country and abroad.

We believe this publication will do more to advance the South than anything ever done before, and that hundreds of millions of capital and hundreds of thousands of men and women will sooner or later take up the southward march as a direct result of this work.

We feel, therefore, that every advertiser in this issue has joined in a great campaign, not simply for the advancement of his own individual interests, but for the broadest upbuilding of the South to the benefit of every town and city and every business institution in the whole section. The business houses and the towns and cities represented in the Descriptive Advertising Section and in the display pages in "The South: The Nation's Greatest Asset" are typical of the men and institutions and the towns and cities which have made possible the marvelous progress of this section during the last quarter of a century or more. The extent and variety of this advertising is in itself one of the highest tributes to the energy and broad vision of the people who are making the South what it is. Every advertisement helps to strengthen the influence which this publication will have by showing to the world that the South is a land of energy and activity, a land whose people are willing to back their faith by their works.

To our readers everywhere, in the South and other sections and in other lands, we would commend our advertising pages as worthy of their careful study, for in them they will find facts of profound interest.

## Uncle Sam's Views of the South



UNCLE SAM having repented of some of the things which he did years ago, which resulted in retarding the development of the South, now seeks to atone for his mistakes and to tell how he regards the South, what he thinks of its past and its influence in shaping the destiny of this country, of its marvelous progress during the last thirty years, and of its great future. These facts are presented in an editorial interview with Uncle Sam, which will be found on pages 83-89 in this publication. Be sure to read what he says about the South—past, present and future—for the facts presented will prove of interest to every man in the South, and to every man in this country or in any other, who desires to know about the South, what it has done, what it is doing, and what it is destined to do.

# Some Southern Assets Which Combine to Make the South the Nation's Greatest Asset



IN THE balance sheet of a nation its assets and their availability for development must be clearly stated if its people, who are the stockholders, are to get a true understanding of their property and its future. The South's assets in natural resources and geographical location make it the nation's greatest asset. The reasons for this should be carefully studied by the people of the whole country.

In the past much of our national development was forced by artificial means or artificial conditions, both of which have now been changed. Powerful forces created material development lacking in many respects a sure and safe foundation. The badly located factory or furnace is doomed. Economic influences, mightier than the power of man or the decrees of government, ultimately work out their own laws. They may grind slowly; but, like the mills of the gods, they grind exceeding small.

The South comes upon the stage of its real broad development the heir of all the ages, the inheritor of all the achievements of science and industry, without having to pay in the future the cost of the vast experiments of other sections in material upbuilding. Through the disasters of war it paid the price, and, having recuperated from those losses, it is now in a position to utilize in the development of its advantages and resources for every line of human activity all the knowledge gained through all the experimental work of scientific authorities of this and other lands.

In the light of this situation it is appropriate, therefore, that the balance sheet of the South's assets should be elaborated in some detail, because these assets give to it the most strategic position in commerce, in agriculture and in manufactures known to mankind.

## The Foundation Stones On Which the Arch of Civilization Rests

The arch that spans the world, upholding the industrial temple, the existence of which makes possible modern civilization, has as its foundation stones, fuel and iron, with cotton as its key-stone. Destroy any one of these and the temple would go down in ruin, and the world's industrial structure crumble into dust. For other stones which have been builded into the arch substitutes could be found. Not so with fuel—coal, gas, oil—or iron or cotton. For them man knows no adequate substitute. Without fuel the world's industrial and railroad interests would practically cease, since hydro-electric powers are inadequate to supply electricity sufficient to meet the demand. Without iron and its child, steel, the railroads would disappear from the face of the earth, as would all other forms of modern business built on iron and steel. The iron steamship would be no more, and civilization, deprived of the thousand and one things which enter into every form of modern life made out of iron and steel or based on iron and steel, would sink back into barbarism.

And yet, surpassing in all-embracing importance either of these foundation stones, is cotton, the keystone. The measure of civilization's advance is its consumption of cotton goods. It has been said that the missionary of the Gospel as he penetrates the wilds of heathen lands is, indeed, an advance agent for American cotton, for wherever Christianity carries its benign influence, changing man from barbarism to civilization, there follows as sure as day follows night an increasing demand for cotton goods.

These three staples, the foundation stones and the keystone of civilization's arch, are not found anywhere else in the world in quantity in such close proximity as in the South. If we would understand their power for the upbuilding of the wealth of the South, of the United States and of the world, we must know something of their extent and their availability for utilization in this section in comparison with other lands. We must also know what their utilization elsewhere has meant to the world's material interests as well as to its civilization.

It was Great Britain's ability to assemble its coal and ore to such an extent as to give it for many years primacy in iron production, and in connection therewith to carry the cotton of

the South 3000 miles, spin and weave it and distribute the finished product to distant regions that gave to that country its supremacy in finance and in international commerce. Without the wealth created by coal and iron and cotton, the financial geniuses of Great Britain would never have been able to achieve what they did. However clear their vision might have been, they would have had no tools of trade with which to work out their plans, the carrying out of which made Great Britain for many years the leader in the world's financial, manufacturing and shipping interests. Not her statesmen, except as her statesmen worked with the tools furnished by iron and coal and cotton; not her far-seeing bankers, except as they used the same instruments; but her iron and steel makers and her cotton manufacturers gave to Great Britain the power to lead the world in material activities and in the civilizing work which has marked her career wherever her flag has been planted in lands of barbarism, with its tremendous influence in carrying the light of civilization where darkness had reigned.

When the story of the world's march from the gloom of the Middle Ages to the noonday splendor of today is rightly written, it will deal with the power of the engine, the locomotive, the steel rail, the coal and the cotton goods as more vital factors in human advancement than the work of the warriors and the statesmen. Back of the warrior and the statesman, greater in its strength for the uplifting of humanity, the creation of employment and the development of wealth, has been the power of the awakened consciousness of the world through the efforts of the men whose genius made coal and iron and steel and cotton living realities, breathing into human activities and human aspirations the very breath of life.

## Coal, Oil, Gas and Iron—Their Relation to World Progress

The amazing growth of Germany's commerce and manufactures in the last 25 years, surpassing that of any other country except the United States, was achieved through the development of its coal, iron, steel and kindred interests brought into existence by them. With small coal area and with iron ore limited in quantity and quality as compared with ours, Germany has outstripped Great Britain in the magnitude of its iron and steel output. In our own country we know something of the almost boundless wealth created in Pittsburgh, and for that matter in all Pennsylvania, in Ohio, Illinois and elsewhere, by coal and iron and steel; and in New England by the manufacture of cotton goods out of the South's royal staple. We are, therefore, able to judge somewhat of the wealth that can be created by the development of coal, and oil, and gas, and iron ore, and cotton in the South when we measure the extent of these resources in that section alongside of what other sections or countries can show.

In considering the imperial extent of the coal of the South, one fact of most significant importance should be taken into account. This is, that according to the reports of experts, three-fourths of the coking coal of the United States is found in this section. Some experts say that the United States has more ore than coking coal, and that the iron and steel industry of this country is not dependent so much upon the supply of ore as it is upon that of coking coal. The Connellsville field of Pennsylvania, upon the existence of which has been built the iron industry of the Pittsburgh region, is being rapidly exhausted. It is small in area, and the best authorities give it at the outside a life of not more than 25 or 30 years before the entire supply will be exhausted. It is not, of course, possible to mine the last ton, nor the last million tons, for long before mining operations have reached that point the lessening production would make mining unprofitable.

To the South, therefore, the country must look for its supply of coking coal. This section not only has the largest and best fields in the United States, but the largest and best fields known to the world; larger, in fact, in the aggregate and superior in quality of coke to all the known coking fields of this and other lands, eliminating China, about which comparatively little is yet



really known. The South, therefore, holds the world's primacy for coking coal as to quantity and quality.

Europe, which is now mining over 600,000,000 tons of coal a year, and it is primarily upon its coal that its industry and commerce are staked, has a total of 44,000 square miles of coal land. Of this, 20,000 square miles are in Russia and for many years will not be developed largely. Other continental countries—Germany, France, Austria, Italy, Belgium and Holland—and Great Britain all combined have 24,000 square miles of coal. The South has 88,000 square miles of coal area, or twice as much as all Europe, and nearly four times as much as all of Europe, excluding Russia. In addition to this, it has 84,000 square miles of lignite, which, through modern methods of utilization, is available as a fuel supply.

With relation to the coal requirements of this country, to the proximity of iron ore, and the ability to assemble local and foreign ores to meet Southern coke, and to the expanding demand of the West Indies, of Central and South America and Southern Europe for coal, the South holds a strategic position which has no equal. Except as to a limited area in Pennsylvania, no other coal territory in the East or West can reach foreign markets. It is, of course, not possible for the coal of the interior—Ohio, Illinois, Indiana and other States—to pass the better and more cheaply mined coal of the Virginias, Kentucky, Tennessee and Alabama for foreign trade, it matters not how great may be the ultimate foreign demand. With the increasing consumption of coal and the increasing cost of mining in Europe, due in part to the depth of mining and in some places to the narrow veins, and likewise to the higher rate of wages prevailing as compared with former years, Europe can no longer supply its own needs; much less will it be able to take care of the growing requirements of South and Central America and the West Indies for high-grade coal. This the South, and the South alone, is able to do.

It is inevitable that the South will become the chief coal exporting region of the world. It is already beginning to develop a large coal trade with the Mediterranean, with the West Indies and with South America. Expansion along these lines must be very large in the future and the world will of necessity, as the demand for coal grows in non-coal-producing countries, be compelled to look to the South as the chief source of its supply. In this respect the South holds a strategic position in coal, ranking somewhat akin to its dominating strength in cotton.

### "The Gibraltar of the Lights and Fuels of the World"

In connection with the coal situation, the South is likewise equally as blessed in the other sources of power necessary to industrial advancement—natural gas and oil—while its water-power potentialities are so extensive that they are commanding the attention of the foremost banking houses and industrial concerns of Europe, as well as of this country. The South is the greatest natural gas region known to geologists. What may be discovered in the future in other sections or in other lands cannot be foretold; but at present the South is able to show a more abundant supply of gas available for industrial operations than is known anywhere else on earth.

Through the development of the internal combustion engine, oil and gasoline are becoming dominant factors in power creation. We cannot at present set any limit to the oil resources of the South. We do know that this section is producing over 90,000,000 barrels a year, as compared with 63,600,000 for the entire country in 1900. And yet, its territory has not by any means been fully explored, and the possibilities of oil production are doubtless far beyond anything now known. As its resources in coal, oil and gas far surpass Europe's known supply, their influence for material advancement must be very great. Indeed, an English authority has said that the South is the "Gibraltar of the lights and fuels of the world."

### The Water-Powers of the South

In the rivers and mountain streams of the South there is now running to waste water sufficient to develop about 9,000,000 horse-power, in contrast with the 1,000,000 horse-power already utilized in this section. The total steam horse-power used in operating all the manufacturing establishments in the South, as reported by the census of 1910, was 3,429,000; nearly three times as much power can be developed by hydro-electric operations through the utiliza-

tion of the water-powers of the South. At the present time about 1,000,000 hydro-electric power is in operation in the South. Much more than that amount is controlled by companies now actively at work developing other powers. Probably the most striking enterprise, because of its far-reaching effect abroad as well as at home, is the undertaking financed by leading English bankers for spending about \$50,000,000 in Alabama to develop water-powers which the company owns, having an aggregate potentiality of 400,000 horse-power. The influence of this investment of foreign money and the work which the people behind this enterprise have in view will result in the building of many industrial enterprises to consume the power generated. One of these plans, though temporarily delayed by reason of a veto of Congressional action, will be for the extraction of nitrate from the air for use in fertilizer manufacturing. It is expected that some large chemical industries will be established in Alabama by foreign people attracted to the State by the operations of this syndicate. It is likewise altogether probable that as an outcome of these developments some large cotton mill enterprises will be located in the central South by English manufacturers with a view to the production of cotton goods for foreign trade, so as to reach the Orient through the Panama Canal, and thus save the expense involved in the shipment of cotton from the South to England and its reshipment in the finished form from Manchester to the Orient.

There are many other hydro-electric developments of almost equal magnitude under way. One company in the Carolinas already has about 200,000 horse-power developed, and in connection therewith has established a nitrate-producing plant and is building an interurban railway system, which will ultimately have several hundred miles of track reaching many of the most prosperous industrial and agricultural sections of the Piedmont region of the Carolinas. In West Virginia, Tennessee, Georgia and elsewhere hydro-electric operations involving in the aggregate many millions of dollars are being vigorously pushed.

The completion of hydro-electric undertakings now definitely financed and under way in the South will involve an outlay of probably \$150,000,000 to \$200,000,000 and generate about 1,500,000 or more hydro-electric power. A very large proportion of the capital which is going into these undertakings is from England, Canada and the West, while Eastern financial centers are, of course, as usual identified to a greater or less extent with these developments, as with nearly every other broad movement for the utilization of the South's resources.

Considering the remarkable combination of coal, oil and gas for power development in connection with the potentialities of the South in water-powers, it may safely be said that in the extent and fullness and availability of its fuel and its streams for the generation of power—and power means progress and wealth in proportion to its cheapness and extent—the South presents the strongest situation known to man.

Thus the South, because it has these sources of power, is an asset to the United States and to the world, whose value is beyond computation. Statistics fail to present an intelligent exhibit of the magnitude of this asset, and of how its utilization will add limitless wealth to the whole country and to all nations, advancing civilization through the advancement of commerce, the arts and science, for it is difficult to think in billions, whether these billions be of coal or iron or oil or gas or money.

### The Iron-Making Resources of the South

Somewhat commensurate with the strength of its position in coal, and oil, and gas, is the South's strength in iron and steel making possibilities. With its supplies of iron ore running into billions of tons and in closer juxtaposition to coking coal than anywhere else in the United States, the progress of iron and steel making in this section in the next 10 or 20 years should be very much greater than that of the last two decades. In its early stages the iron industry of the South had to pass through all of the infantile diseases—lack of capital, lack of skill, lack of a home market—from which the Pennsylvania iron interests suffered for many years. The disasters which attended some of the iron interests of the South were not greater than those which the iron interests of Pennsylvania had to meet. There was a time when the banking interests of the Pittsburgh district were inclined to look upon the iron business as their most unsatisfactory customer and the one to which they were least inclined to lend money. These

facts are sometimes overlooked because of the overwhelming prosperity and wealth created during the last quarter of a century by the iron and steel and coking coal interests of Pennsylvania and some of the nearby States. More than 10 years ago the late Abram S. Hewitt, one of the master minds of metallurgy, predicted that within a quarter of a century the South would dominate the basic steel industry of the world. Some questioned the correctness of Mr. Hewitt's prophecy, but he knew far more about the steel-making resources of the South than his critics. He looked beyond the temporary ups and downs in the development of that industry, and saw that what nature had done for this section would bring about the fulfillment of his forecast.

Though the Birmingham district is now the South's chief iron and steel producing region, there are other points at which large developments will inevitably be made. The resources in coal and ore of the Chattanooga district and of other places in the Appalachian region are ample to justify the establishment of steel works on a large scale. Texas, with its large stores of high-grade iron ore, will almost certainly become an important iron and steel producer. It is likely that the iron industry of that State will be developed first at some point on the coast, where the ore can meet the coking coal of Alabama or other Southern States. The proximity of the South to Cuba, with its high-grade ore, and the ability of this section to draw on South America and the Mediterranean for ore, will doubtless result in bringing about the establishment at South Atlantic and Gulf ports of great iron and steel and shipbuilding plants, such as that at Sparrows Point, Md., where ores from foreign lands meet the coal of West Virginia, resulting in the establishment of one of the foremost steel and shipbuilding plants in the country.

Whenever the increasing demands for iron and steel necessitate the South's calling upon other lands for ores, it will be in a better position by virtue of geographical location and its coking coal supply than any other part of the country. With many of the foremost capitalists of the country concentrating their attention and their wealth upon the development of ports at South Atlantic and Gulf points, it is certain that they will become interested in the establishment of iron and steel plants at some of these localities.

In this connection it may be suggested that the opening of the Panama Canal will result in bringing ores of various kinds from the rich mineral regions of South America to be smelted at Southern seaboard points. The west coast of South America, with its vast supplies of copper and other ores, which now have to be shipped in many cases thousands of miles to be smelted, should pour a wealth of minerals through the Panama Canal to reach the ports where coking coal for smelting purposes can be had at the lowest cost, and these points will be Southern ports.

With one-third of the country's population, the South is producing only about one-tenth of its iron and a much smaller fraction of its steel. Heretofore the consumption of iron and steel per capita in the North and West has been larger than in the South; but as this section is to be the center of the greatest activity in America, as railroads must be rebuilt and new lines built, as great skyscrapers must go up with city building activity, and as this section is in a better geographical position to produce iron and steel for foreign trade than any other part of the country, we can safely count that the per capita consumption of iron and steel products will certainly in the near future be nearly as great as in the rest of the country today. If the South were now producing iron and steel in proportion per capita to the rest of the country, it would be producing 10,000,000 tons of iron instead of 3,000,000 tons, and steel in proportion.

Here is an indication of how great must be the growth of the iron and steel industry of the South before this section produces as much of these materials as it consumes. Under such conditions, with the increasing wealth available for metallurgical advancement, it is certain that there will be a large expansion of iron and steel making and of industries to consume iron and steel throughout the South during the next 10 or 20 years. Within 15 years the South should certainly treble its iron production if it shall only take care of the local consumption in the final finished forms, for during that period the per capita consumption of iron and steel products in the South ought to equal the present rate in the country at large, and that would require considerably more than the trebling of its iron output. An increase in the con-

sumption of iron in its own foundries and machine shops is, however, for the present the supreme need of the South's iron interests. Instead of having to look to the North and West for a market for much of its pig iron, it must turn its iron into steel and other finished products at home.

### Cotton: A World Asset With World Prosperity Depending Upon It

The cotton of the South feeds two-thirds of the spindles of the world. It is the most important single crop grown on earth. It is more closely interwoven with all the financial and industrial interests of mankind than any other one crop. The development of the cotton-growing industry of the South during the first half of the last century was the greatest business achievement of that period. It had required as much energy and a higher order of business ability than the creation during the same time of the manufacturing interests of the country. Moreover, it represented more capital than the entire manufacturing business of the United States. The Southern planter, whose executive ability, whose knowledge of the soil, whose management of men enabled him to create a well-rounded agricultural industry in which the South produced nearly all of its foodstuffs and made cotton largely a by-product crop, worked out a scheme of agriculture which made the farming interests of the South prior to 1860 yield probably a larger profit than the farming interests of any other region of this or any other land ever made in proportion to the people employed.

In the last 10 years the value of the cotton crops of the South, with their seed, have exceeded by \$2,856,000,000 the total output of gold and silver in the world. In that period the South has exported to foreign lands cotton of an aggregate value of \$4,412,000,000. These exports exceed in value by \$430,000,000 the total gold production of the world during the same period. In other words, through the possession of cotton the United States has been able in effect to bring to this country in actual gold or in credits \$430,000,000 in excess of the total value of every ounce of gold mined since 1902. No other country has a monopoly of any great crop of international importance to such an extent as the South has in cotton. In this respect the South is unique in its domination of cotton. Millions of people in the factories of other lands and in the industries connected with cotton manufacturing and some billions of dollars of capital invested in these enterprises are wholly dependent upon Southern grown cotton. Without it millions would starve and billions of capital would be destroyed.

To the pessimism rampant throughout Europe and to some extent in this country a few years ago as to the ability of the South to meet the increasing consumptive requirements of cotton in all lands, the South gave its answer in 1911 in the production of 16,500,000 bales. That demonstration of what it could do in cotton growing answered every argument that has been raised in the last 75 years in Europe as to the necessity of trying to grow cotton elsewhere for fear the South might be unable to keep up the world's increased needs. That crop of 16,500,000 bales is, however, to be taken merely as an indication of what this section can do whenever the world pays a good price for this staple.

The increasing use of fertilizers, the better cultivation of the soil, even by some heretofore shiftless tenants, white and black, are clearly showing how the cotton crop can be continuously enlarged, even without any material increase in acreage. Given a good price for cotton, a price in keeping with its intrinsic value, with the cost of production and of its natural monopoly, the South will be able to produce 40,000,000 to 50,000,000 bales whenever the world's requirements demand it.

For three-quarters of a century Europe has sought to lessen its dependence upon the South for cotton, but Europe is today more absolutely dependent upon this section for cotton than ever before, and the efforts made of recent years to grow this staple in other lands give less hope of success than similar efforts vigorously supported by the British Government more than half a century ago. For the next generation at least there need be no fear of the South's continued monopoly of cotton production.

With fuel as one of the foundation stones of the arch, with iron and steel as the other and cotton as the keystone, the South's position in relation to national advancement and to world progress is unlike that of any other country.



Indeed, in these three things, changing the form of speech, the South holds the master key to unlock the vaults of wealth which shall enrich the nation, add marvelously to its commerce, its manufactures, its agriculture and its domination through business of world affairs.

In its wealth of these materials, the South has an asset with which all civilized people are more vitally concerned than in the resources of any other country on the globe.

### Human Advancement Dependent Upon Soil Fertility

Agriculture, the primary industry of man in the progress of which every human being by virtue of the need of foodstuffs is vitally interested, would perish from the earth were it not that nature has provided ways for restoring to the soil the elements taken from it by growing crops.

Whenever any country has failed to revitalize its soil, agriculture has perished and destruction has followed. New lands, like the prairies of the West of former days, are no longer available. We cannot cultivate one section until we have exhausted its fertility, abandon that and seek a new country of fertile lands. We are compelled to restore fertility to the soil that is being exhausted and feed it with life-giving elements, as we must feed the body if we would keep it alive. The manufacture of commercial fertilizers has become one of the most important industries known, and its influence is only beginning to be realized. Under the stimulating work of better fertilization the South is largely increasing the average production of its crops, and with continued work in this direction it will be possible for this section to double its entire agricultural output, even should it not add a single acre to the land under cultivation. With proper tilling and adequate fertilization the 175,000,000 acres now being farmed in the South producing \$3,000,000,000 a year, could be made to yield \$6,000,000,000. Indeed, agriculture in the South is in its infancy. The future is radiant with the sunshine of increasing prosperity. In the fertilizer industry, so essential to agricultural life, the South has a position as interesting and almost as unique, compared with all other lands, as in cotton and coal.

There are 50,000,000 acres of overflowed or wet land in the South today hardly worth \$500,000,000. Drained and reclaimed, as is now being done on a large scale, their value will easily go to \$5,000,000,000, and ultimately to several times that amount. This area is about 30 per cent. greater than the total acreage annually given to cotton growing. No richer land is known. A vast acreage of cut-over timber land, long an eyesore because dreary and desolate, is now to be utilized, for it is found that much of it will produce as luxuriantly of crops as it did of timber.

Into the manufacture of fertilizers sulphur largely enters as sulphuric acid. One mine in Louisiana is producing nearly one-half of the sulphur of the world. Another sulphur property, estimated by experts to be of equal importance, has recently been opened up in Texas. Pyrites ores in various parts of the South furnish another source for the creation of sulphuric acid; while copper smelting, at one time unprofitable when operated primarily for the copper yield, has been made very profitable by catching the sulphur fumes which formerly meant death to surrounding vegetation, turning them into sulphuric acid and giving to this section the largest sulphuric acid industry in the country as a by-product of copper smelting. Thus this section has vast resources for the production of sulphur and sulphuric acid, though it now draws largely upon foreign countries for pyrites in acid-making.

A very large percentage of the phosphate rock used in Europe and all used in America are mined in the South. We are shipping 1,200,000 tons a year to Europe of phosphate rock in order to enable that continent to supply its farmers with the fertilizers needed in their work. Florida and Tennessee hold the dominant position in phosphate rock output, Florida leading, with South Carolina third on the list. Thus the South is almost as strong in this essential to the fertilizer industry as it is in coal and cotton. In connection with the cottonseed oil industry, which has been created out of what was for years a waste product, there are by-products which are essential ingredients in the manufacture of fertilizers. This section, therefore, with its ability to produce fertilizers out of its own raw materials, to restore to the soil the elements used by growing crops, is in advance of any other part of the country. The time is rapidly coming when the former fertile prairies of the West will need commercial fertilizers as

badly as any other part of the land. Indeed, Western crop conditions are materially changing and the character of production is deteriorating in many portions of the West by reason of the loss of phosphorus and other ingredients from the soil through the failure to use freely of commercial fertilizers. The West will have to draw heavily upon the South for fertilizers or fertilizer materials.

It may not be amiss while on this subject to mention the sulphate of ammonia which comes as a by-product of coke-making in modern by-product ovens. Every ton of coke thus produced in the South furnishes raw material for the fertilizer industry, and with its vast supply of coking coal it can add immeasurably to its supply of sulphate of ammonia. From the air we are beginning to extract the nitrates, using the cheap water-powers of the South, and this, too, adds to the strength of the Southern situation in fertilizer production.

### The South Has More than 40 Per Cent. of the Standing Timber of the United States

The South is now cutting more than one-half of the lumber cut in the entire country, but it still has more than 40 per cent. of the standing timber remaining in the United States. Fortunately for the country, the waste of timber will be much less than when the great forests of Michigan and other Northwestern States were being destroyed. The utilization of timber waste is one of the most striking phases of the by-product age upon which we have entered. Millions of acres of cut-over timber land, heretofore a liability, yielding nothing to the country and an eyesore to the traveler, are now to be cleared of stumps by modern methods which make possible the pulling of the stumps and their use in the production of naval stores. This liability therefore becomes an asset. Millions of acres of land heretofore almost without value are suddenly becoming very valuable. The lands that could produce magnificent forests have in them the elements of soil that make possible profitable agriculture. Timber waste is now being used in the manufacture of paper, in the production of ethyl alcohol and for many other purposes. The wastage, which has been enormously great, is now to be saved. Heretofore, much of the lumber of the South has been shipped out of this section to other regions and to foreign lands. A great deal of it has been brought back in the shape of cars, wagons and furniture. A change is taking place in this respect. The development of diversified woodworking interests in the South is enlarging the output of cars and wagons and furniture, and the thousand and one things into which wood enters. There is yet great room for expansion, for the growth of these industries is possibly not quite in keeping with the growth of the South's consuming power. With the complete utilization of the entire tree, from the lowest roots to the topmost limb, and the reclamation of the soil from the unutilized condition of the past to profitable farming operations and with the growth of woodworking interests, the lumber business of the South in all its branches will become a far greater wealth producer than heretofore. In fact, the timber now standing in the South will, as a creator of wealth and of employment, be worth many times as much to the South as all that has been cut through all the past. By reason of an abundant rainfall, a long growing season and rich soil, timber reproduces itself far more rapidly in the South than in other sections, a fact which is of significant importance in all forestry work.

### Granites, Marbles, Clays and Other Minerals

If there is one material resource possessed by the South in greater proportion than is known in any other land, it is doubtless building stones and the clays which can all appropriately be treated under one general heading. This section is pre-eminently a granite, marble and clay region. Maryland is a granite State, and through a very large part of the South out to Texas granites of the finest quality and in the greatest abundance are to be found. As one looks upon the vast granite deposits of North Carolina and Georgia he might be excused for believing that the very center of the world's granite supply is in these States; but as he passes on to Texas he is even more bewildered by the immensity of the granite deposits of that State and the quality, the beauty of texture and the wide variety of these granites.

And as to marble of every variety, a little story may illustrate the situation.

A few years ago an Italian sculptor of considerable fame in a visit to the marble regions of Alabama was horrified to see one of the iron companies of eastern Alabama dumping into its furnace day after day many tons of marble for fluxing purposes, of a quality which the sculptor declared to be equal to the finest Carrara marble. To him this was an unspeakable outrage, for he had been taught in Italy to look on Carrara marble as of almost priceless value. He went to the president of the iron company to protest against such use of this splendid marble, but was told that the quantity was so vast that it was the cheapest limestone flux which could be found for the furnace purpose, and that he need never fear that there was not enough of this marble to supply the world's needs. In that particular section of Alabama this high-grade beautiful marble is in abundant supply. One of the most distinguished experts of the United States Geological Survey stated a few years ago that that region was far more richly endowed with marble than Vermont, and would ultimately surpass Vermont as a marble producing center. The extent of the marble supply of the South is only indicated by this little story about the Alabama situation. Other States have great marble resources that are seemingly inexhaustible and a variety not surpassed anywhere else in this or any other land.

### Cement the Most Amazing Material Development of the Age

Richly endowed as the South is with marbles, granites and clays, it has many other sources of mineral wealth. It produces a large proportion of the world's supply of zinc and lead; it is rich in fuller's earth; it has great stores of copper and gold ores, and the success of the copper smelting operations in East Tennessee in the manufacture of sulphuric acid as a by-product, opens up the possibility of the utilization on a large scale of the vast supplies of low-grade ores heretofore not easily smelted to a profit.

The rapidity of growth of the Portland cement industry in this country probably surpasses that of any other important manufacturing interest in the world's history. It is difficult to set a limit to the expansion of cement making, for scarcely a day passes without opening some new avenues for the profitable use of cement. In city building activities it has come almost providentially, it would seem, to supplement iron and steel and lumber. Without Portland cement it would not have been possible to carry on the vast building operations of the last 10 or 15 years, for a famine in iron and steel and lumber would have been created. Cement has become one of the world's fundamental industries, entering into building operations of almost every character, into the making of streets and sidewalks and roadways, the building of bridges and barges and into varied uses on the farm from the construction of silos and the making of fence posts, to the fashioning of water troughs for live stock. Any country without the raw materials for the manufacture of Portland cement would therefore be seriously handicapped in this day when it enters so largely into all construction activities. It is, therefore, indeed fortunate for the South that it is as rich in cement-making materials as in the other fundamental industries of coal and iron and cotton and lumber. In the manufacture of cement, as in every other industry, there will be periods of ups and downs, fluctuations in prices, years of prosperity and years of poverty, and years in which it would seem that no other plant need be built, and years in which existing plants are wholly unequal to requirements. With its abundant supplies of cement rock and its great stores of oil and gas and coal as sources of fuel, for fuel is a vital factor in the cost of cement production, the South has already made strides in this industry. The production of Portland cement in the South in 1911 was 10,881,000 barrels, as compared with 8,482,000 barrels for the entire country as late as 1900. However great may be the demand for Portland cement in the future, the resources of the South are equal to meeting the needs of increasing consumption.

### A Unique Situation Which Has No Duplicate

The South has more than one-half of the coast line of the country. Its strategic geographical location with reference to foreign commerce and coastwise trade, and the 3007 miles of ocean and gulf coast, give to the South a commanding position unlike that possessed by any other section of the country. Most

of the important rivers draining the country, empty into the Atlantic or the Gulf through the South. The Mississippi itself and its tributaries drain the richest valley in the world, stretching from the Alleghenies to the Rocky Mountains, and from Canada to the Gulf. James J. Hill was once quoted as saying that if a barrel of flour was kicked over at Minneapolis it would roll down hill to some Gulf port. It is a downhill haul from the mountain regions, as well as from the Lake country, to Southern ports. The influences which in early days turned the foreign commerce of the country to Eastern ports, have ceased to dominate the situation and natural laws, backed by the vast capital that is now being put into transportation facilities to carry the trade of the West to South Atlantic and Gulf ports along "the line of least resistance," make certain that the increase in our foreign trade in future years will to a large extent be at Southern ports. Ample in number, splendidly located with sufficient depth of water easily available to take care of any commerce, however large it may be, these Southern ports are to be great world centers of trade and commerce.

This section is already producing nearly one-half of the foreign export trade of the country. It is inevitable that this percentage will increase. Growth of population in the United States is causing a constant expansion in the home consumption of food-stuffs, leaving an ever-lessening amount available for export. As the years go by our foreign shipments of wheat and provisions, two of the great factors in our commerce for many years, will continue to decline. On the other hand, the South is abundantly able so to increase its cotton production to meet the world's ever-increasing demand for cotton. Thus, the superiority of the South in the maintenance of our balance of trade, based on the \$500,000,000 or \$600,000,000 of cotton now annually exported, will not only relatively increase as compared with the exports of food-stuffs, but will actually increase from year to year as the South expands its cotton production to meet the world's requirements for cotton goods. The time is not far distant when the South's cotton exports will annually exceed \$1,000,000,000 in value.

There is no other region in the world possessing the remarkable combination of advantages which gives to the South its overmastering position for the widest diversity of agriculture, the widest diversity and extent of manufactures and with a long seacoast, enabling it to ship its products, agricultural and manufactured, at the lowest cost to all parts of the world. It has unsurpassed climatic advantages; it has the bracing air of the high mountains and the soft and balmy breezes of the semi-tropic region of the lower Gulf coast; it has every variety of soil needed for the production of wheat, corn, oats, hay, cotton, potatoes, sugar, rice, apples, peaches, citrus fruits, figs and nuts, as well as for every vegetable of importance known to man. There is practically nothing grown elsewhere that cannot be grown to advantage in the South, and there is probably not a manufacturing industry of international importance in all the world for which exceptional advantages cannot be found in the South.

Here is a remarkable situation, unique in all the world; the more it is studied, the more closely it is investigated, the more the South's supreme position as the greatest asset of this country, and in many respects the greatest material asset of the business world, will be impressed upon every thoughtful man. The South is indeed the nation's greatest asset.

### To Become the World's Garden

Hon. Abram S. Hewitt, one of America's foremost citizens and one of the world's greatest metallurgists, in a letter to the Manufacturers Record some years ago, said:

"The water-powers of the South are upon a scale of grandeur unequaled elsewhere, and will in the future be all utilized for productive industry. Every element for success exists in the South—in raw material, in climate, in the natural forces of nature, and, above all, in an abundant supply of labor. \* \* \* There is no corresponding region on this habitable globe which has so many advantages as the South, all available by natural or artificial communications, and capable of more economical operation than in any other part of the country. The Manufacturers Record has done its part in directing attention to the possibilities of the South, which, it seems to me, owes to it a debt of everlasting gratitude. Your recent address in favor of industrial education is one of the most valuable contributions which has ever been made to the conscience and interests of any people, and if it is acted upon the South will become the garden of the world."



# Productive Workers as a Southern Asset



SINCE the revival thirty years ago of the opportunity for the development of the natural resources of the South that section has advanced in production at a greater rate than the rest of the country. Between 1880 and 1910, with its population increasing at the rate of 74.5 per cent., the South increased the value of its mineral production 1699 per cent., the value of its manufactured products 489 per cent., and the value of its agricultural products 290 per cent. In the same period in the rest of the country, with an increase of 87.2 per cent. in its population, including the drift of negroes away from the South and the swelling tide of foreign immigration, increased the value of its mineral products 349 per cent., of its manufactured products 328 per cent., and the value of its agricultural products 315 per cent.

Dwelling upon figures of values and quantities in production sometimes obscures facts about the actual productive workers represented in the wage-earning groups. The accompanying tables make an interesting exhibit of an increase in the number of these Southern workers since the beginning of the present century paralleling the wealth creation in the development of natural resources. Figures for complete comparison of the first ten years of the century are not accessible, but those that are cited here are sufficient to indicate the general trend. Both in the South and in the rest of the country the number of wage-earners in factories and mines has increased at a greater rate than the total population, and, in all three classes of occupation, at a greater rate in the South than in the rest of the country.

## INCREASE IN NUMBER OF SOUTHERN WORKERS.

	The South.		United States.	
	Increase.		Increase.	
	No.	Per cent.	No.	Per cent.
Farm (1900-1910).....	468,365	16.0	624,130	10.9
Factory (1900-1909)...	424,979	50.8	1,902,283	40.3
Mine (1902-1909).....	122,298	98.7	483,555	83.1
Population (1900-1910)	5,034,886	18.3	15,977,691	21.0

include the members of farmers' families or others who may work around the farm, unless they are managers, tenants or croppers, and that the workers in factories and mines do not include owners, salaried officials or clerks. Some indication of the proportion officials and clerks bear to the whole number occupied in manufacturing, for instance, is given in the fact that there were 124,417 salaried men in Southern factories in 1909 against 1,261,061 wage-earners, and that while the number of the latter increased between 1900 and 1909 at the rate of 50.8 per cent., the number of the former increased at the rate of 125.7 per cent.

Though the value of farm implements and machinery on the farms of the country increased at the rate of nearly 69 per cent. between 1900 and 1910, and though in that period there was a decided advance in the use of gasoline and steam in motors for work on the farms, man-power and mule-power are still the dominant motive forces in farm operations. But there has been a notable increase in the amount of primary horse-power in factories and in mining, in both cases at

a much greater rate in the South than in the rest of the country. In Southern factories the increase between 1900 and 1909 was from 1,918,671 to 4,071,899, or by 2,153,228 horse-power, equal to 112.2 per cent., while the increase in the factories in the rest of the country was from 8,179,222 to 14,608,877, or by 6,429,655, equal to 78.6 per cent. Between 1902 and 1909 the primary horse-power employed in mining operations increased in the South from 417,964 to 877,017, or by 459,053, equal to 109.9 per cent., and in the rest of the country from 2,246,000 to 3,679,153, or by 1,433,153, equal to 63.4 per cent.

## FACTORY LABOR POWER, 1900-1909.

(Number of Wage Earners.)

States.	1900.	1909.	Increase.	Per Cent.
Alabama .....	52,711	72,148	19,437	36.9
Arkansas .....	31,525	44,982	13,457	42.7
District of Columbia.....	6,155	7,707	1,552	25.2
Florida .....	35,471	57,473	22,002	62.
Georgia .....	83,336	104,588	21,252	25.5
Kentucky .....	51,735	65,400	13,665	26.4
Louisiana .....	40,878	76,165	35,287	86.3
Maryland .....	94,170	107,921	13,751	14.6
Mississippi .....	26,799	50,384	23,585	88.
Missouri .....	107,704	152,993	45,289	42.
North Carolina.....	72,322	121,473	49,151	67.9
Oklahoma .....	2,381	13,143	10,762	451.9
South Carolina.....	47,025	73,046	26,021	55.3
Tennessee .....	45,963	73,840	27,877	60.6
Texas .....	38,604	70,229	31,625	81.9
Virginia .....	66,223	105,676	39,453	59.5
West Virginia.....	33,080	63,893	30,813	93.1
Total .....	836,082	1,261,061	424,979	50.8
United States.....	4,712,763	6,615,046	1,902,283	40.3

## FARM LABOR POWER, 1900-1910.

(Number of Persons Operating Farms.)

States.	1900.	1910.	Increase.	Per Cent.
Alabama .....	223,220	262,901	39,681	17.7
Arkansas .....	178,694	214,678	35,984	20.1
District of Columbia.....	269	217	*52	*19.3
Florida .....	40,814	50,016	9,202	22.5
Georgia .....	224,691	291,027	66,336	29.5
Kentucky .....	234,667	259,185	24,518	10.4
Louisiana .....	115,969	120,546	4,577	3.9
Maryland .....	46,012	48,923	2,911	6.3
Mississippi .....	220,803	274,382	53,579	24.2
Missouri .....	284,886	277,244	*7,642	*2.7
North Carolina.....	224,637	253,725	29,088	12.9
Oklahoma .....	108,000	190,192	82,192	76.2
South Carolina.....	155,355	176,434	21,079	13.5
Tennessee .....	224,623	246,012	21,389	9.5
Texas .....	352,190	417,770	65,580	18.6
Virginia .....	167,886	184,018	16,132	9.6
West Virginia.....	92,874	96,685	3,811	4.1
Total .....	2,895,590	3,363,955	468,365	16.
United States.....	5,737,372	6,361,502	624,130	10.9

\*Decrease.

The increase of population in the rest of the country from 48,549,118 to 59,491,923, or by 10,942,805, equal to 22.8 per cent., was accompanied by an increase from 3,876,681 to 5,353,985, or by 1,477,304, equal to 38.1 per cent., in the number of wage-earners in factories; from 2,841,782 to 2,997,546, or by 155,764, equal to 5.5 per cent., in the number of operators of farms, and from 457,864 to 819,121, or by 361,257, equal to 78.9 per cent., in the number of wage-earners in mineral industries.

Population in the South increased from 27,445,457 to 32,480,343, or by 5,034,886, equal to 18.3 per cent., while there were increases in the number of operators of farms from 2,895,590 to 3,363,955, or by 468,365, equal to 16 per cent.; in the number of wage-earners in factories from 836,082 to 1,261,061, or by 424,979, equal to 50.8 per cent., and in the number of wage-earners in the mineral industries from 123,864 to 246,162, or by 122,298, equal to 98.7 per cent. It should be borne in mind that the figures of farm operators do not

## MINE LABOR POWER, 1902-1909.

(Number of Wage Earners.)

States.	1902.	1909.	Increase.	Per Cent.
Alabama .....	19,132	30,795	11,663	60.9
Arkansas .....	2,944	6,422	3,478	118.2
Florida .....	3,146	5,483	2,337	74.3
Georgia .....	2,820	4,014	1,194	42.3
Kentucky .....	10,654	22,033	11,379	106.8
Louisiana .....	61	953	892	1462.3
Maryland .....	6,826	7,745	919	13.5
Missouri .....	15,351	29,676	14,325	93.9
North Carolina.....	1,556	2,825	1,269	81.5
Oklahoma .....	4,942	13,920	8,978	181.7
South Carolina.....	2,694	2,014	*680	*25.2
Tennessee .....	10,890	18,028	7,138	65.5
Texas .....	3,853	6,957	3,104	80.6
Virginia .....	8,993	16,893	7,900	87.8
West Virginia.....	30,002	78,404	48,402	161.3
Total .....	123,864	246,162	122,298	98.7
United States.....	581,728	1,065,283	483,555	83.1

\*Decrease.

Contributing to this increase has been the use of machines in mining coal. In 1900 less than 14 per cent. of the coal mined in the South was machine mined. Ten years later 44,594,488 tons, or 36.9 per cent. of the total coal production of the South, was mined by machine. That was more than six times the amount so mined in 1900. In the meantime the amount of machine-mined coal in the rest of the country increased from 23.5 per cent. of the total mined there to 33.9 per cent. In the ten years West Virginia increased its machine-mined coal production at the rate of more than 718 per cent., Alabama at the rate of more than 700 per cent., and Tennessee at the rate of nearly 594 per cent., and Kentucky quadrupled its output of that kind.

Development of Southern resources of power in its streams and in its natural falls may be expected to make the task of Southern development of the future much lighter from the human standpoint than in the past.



## SONG OF THE INDUSTRIAL SOUTH

By W. C. MOORE

Within the field of song I thrust my hands,  
Like some glad reaper with his task begun,  
Binding the grain with cords by zithers spun.  
Like some glad reaper when the harvest stands  
Rich with its store and golden as the sun.  
And thus in joyous mood I bind and bring  
These sheaves from out the Southland as I sing.

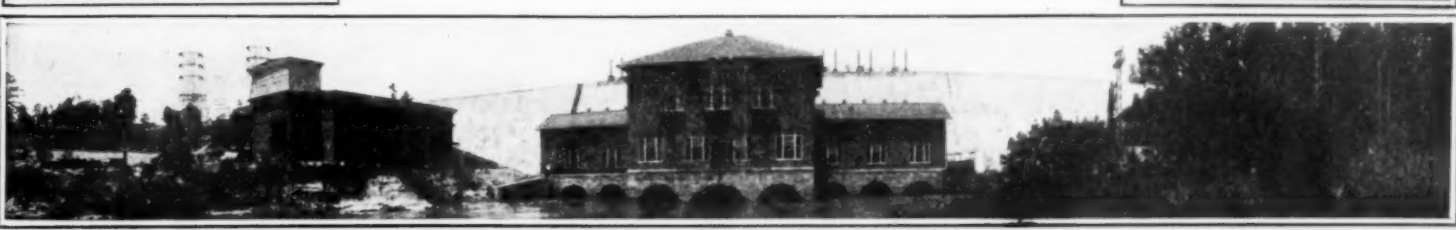
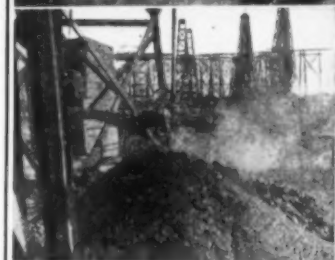
Nor would I sing of war with martial pride,  
But of the furrow, and the man whose tread  
Brings to his callow brood their daily bread,  
Of plowshares forged from swords of men who died  
I raise my voice in mellow song instead.  
The South! The hour! As never yet before  
Dame Fortune knocked against an open door.

And I would sing of whirring wheels, and din,  
Of deafening thunder of the noisy mills,  
Calling in strident jargon to the hills—  
Through winding tunnels to the ore within,  
Of vibrant iron tongues whose clamor thrills—  
Of hot and grimy smokestacks lifting high,  
Like Vulcan's anvil gods against the sky.

And I would sing of tireless men who do,  
Of bin and bushel, and the yeoman's deed,  
Of ships fat-bellied, swollen with their greed,  
Of snow-white cotton fields, where singing through  
Come blacks of nimble tongue and little heed,  
Piling the drifts with merry chat and croon,  
To dull the toil and haste the afternoon.

And thus my zither's field of chords among,  
I thrust my willing hands and bind a sheaf,  
That men may see, and seeing find belief.  
Long years ago have war-mad poets sung  
Of battle-flags, of glory and of grief;  
Sung of this South and of its crimson dead—  
Lo, I sing for the South—and of its bread.

Port Arthur, Tex.





# South's Natural Resources Invite Europeans



COMPARISON of areas and populations of certain Northern European countries with the area and population of the South strikingly demonstrates the potentiality of the South in its equipment as a home for 200,000,000 people.

Eight European countries—the United Kingdom, Germany, France, Holland, Belgium, Norway, Sweden and Denmark, embracing 873,834 square miles of territory—have an aggregate population of 174,285,000.

Sixteen Southern States, with an area of 945,088 square miles, have a population of 33,450,000.

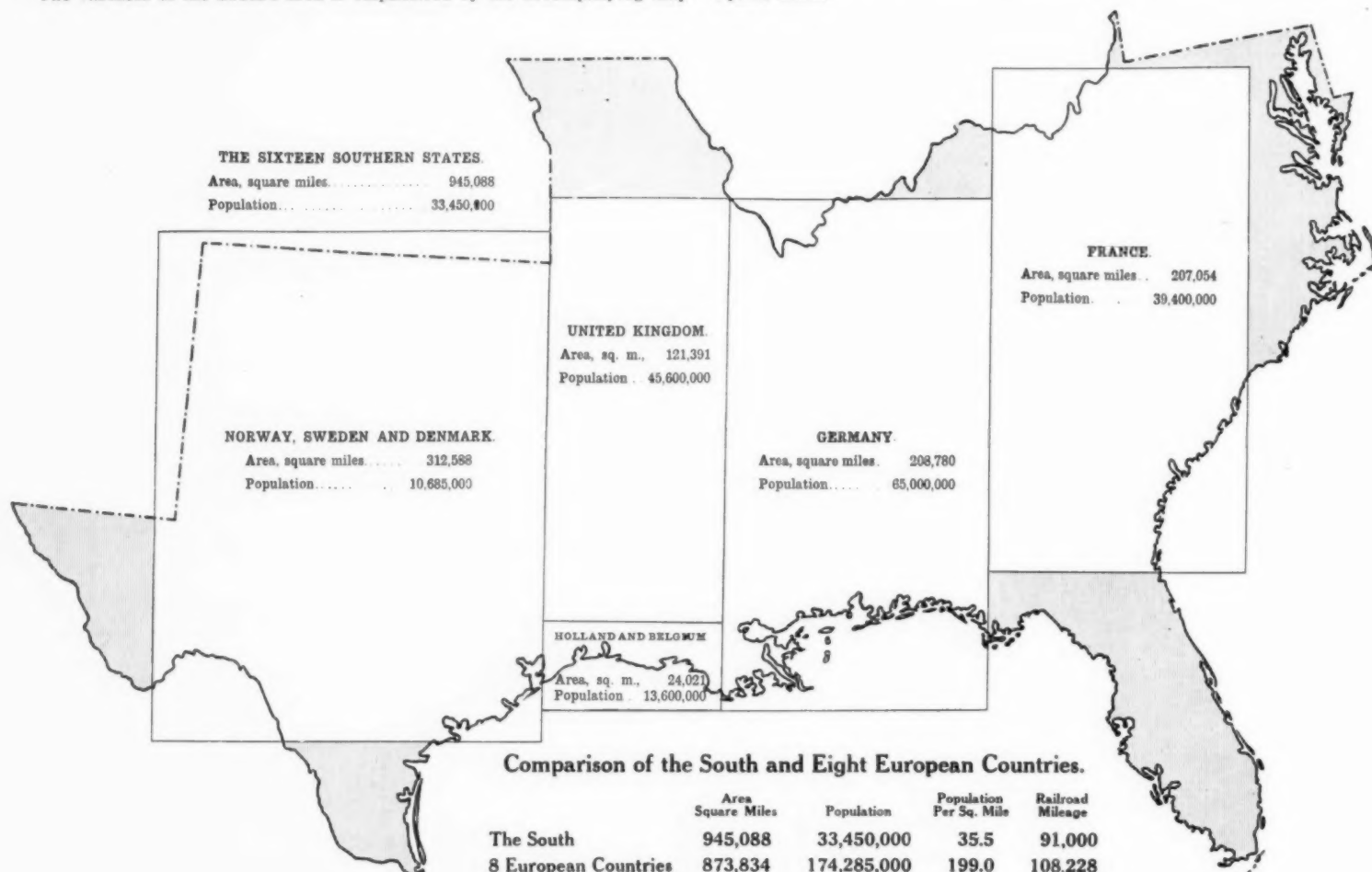
The average density of population in these eight European countries, which have furnished the dominating elements in the population of the United States, is 199 inhabitants to the square mile. The South can easily support a population equal to that of these European countries, and the density will then be only 184.4 inhabitants to the square mile. When the South shall have a population of an average density equal to that of the present in the European countries, it will have 188,072,512 inhabitants, or nearly twice the present population of the United States.

The vastness of the South's area is emphasized by the accompanying map

land, much of which has been salvaged from the sea at great expense and with arduous toil during the centuries. The wet lands of Louisiana alone, less than a third of the total area of the State, are capable of supporting a population equal to that of Holland, whereas the whole State has a population only slightly more than a quarter of Holland's.

Of the total area of the South, 605,000,000 acres, 385,000,000 acres are in farm land, but only 174,000,000 acres are cultivated. Merely energetic and thrifty men are needed to bring the cultivated area up to 400,000,000 acres, and, in the process, 240,000,000 acres of woodland could be maintained as an enduring source of timber.

At present 259,000,000 acres, or nearly 43 per cent. of the total area of the South, are in woodland. Such acreage in the eight European countries ranges from 649,000 acres in Holland to 35,000,000 acres in Germany, where the science of forestry has been carried to a high degree of success. Sweden has about the same forest area as Alabama, and Norway about the same as Mississippi, while the United Kingdom, with its total area of 121,000 square miles, has about 850,000 acres more than Maryland, with a land area of 9000 square miles.



in which rectilinear representations of the areas of the respective European countries are superimposed upon the area of the South.

Louisiana has a land area of 45,409 square miles and a population of 1,710,000. In many respects its topography is similar to that of Holland and Belgium, but those two countries, with an area slightly more than half that of Louisiana, are supporting eight times as many inhabitants, or 13,600,000.

The combined area of Norway, Sweden and Denmark is only 50,190 square miles greater than that of Texas, but their populations are more than two and a half times as great as that of Texas and their density nearly as great as the average density in the whole South.

The United Kingdom has an average of 376 persons to the square mile, Germany an average of 311 and France an average of 190. The density of population in the United Kingdom ranges from 618 in England and Wales to 120 in the Isle of Man. The density in the Scandinavian countries ranges from 19 in Norway and 32 in Sweden to 175 in Denmark. Belgium has the greatest density, 668, of these eight European countries.

The average density of population in the South is 35.5 per square mile. The greatest density of any State in the South, 132.3, is in Maryland.

Not only, therefore, is there very obviously a vast amount of room for people in the South, but the equipment of the South for the support of 200,000,000 inhabitants is beyond comparison with that of the European area under consideration.

Holland, for instance, utilizes productively 75 per cent. of its 8,000,000 acres—3,000,000 in pasture, 2,000,000 in field crops, 600,000 in forests and 185,000 in gardens and orchards. Such production is the basis of the comfort and happiness of 6,000,000 people. Louisiana, nearly four times the area of Holland, has an area of wet lands capable of being cheaply reclaimed to most productive agriculture greater by 1,600,000 acres than the whole area of Hol-

These European lands have known supplies of iron-ore greater than the known supplies of the South. They include, according to estimates of experts a few years ago, 3,608,000,000 tons in Germany, 3,300,000,000 tons in France, 1,300,000,000 tons in Great Britain, 1,158,000,000 tons in Sweden, 367,000,000 tons in Norway and 332,000,000 tons in Belgium, a total of 10,065,000,000 tons. In addition, most of these European countries have large estimated potential supplies. The largest estimate of iron ores in the South above the thousand-foot level stood for three or four years at 10,000,000,000 tons. But less than six months ago diamond drilling in the Birmingham district proved the existence of probably double the supply of formerly known iron ore in that district.

Iron ore, however, both from these European countries and from nearer lands, such as Cuba, must, to make them valuable, inevitably be brought to the South for smelting because of that section's possession of the fuel. In five Southern States lie 75 per cent. of the coking coal of the country, and the easily workable coal fields of the South have an aggregate area more than five times that of the coal fields in these eight European countries, which, including some small areas in one province of Holland and in the southern part of Sweden, is 16,000 square miles. Three Southern States have each a greater area, West Virginia 17,000 square miles, Kentucky 16,670 square miles and Missouri 16,700 square miles, and the whole South has 87,666 square miles underlaid with coal. Maryland has about as great an area of coal lands as Belgium, Virginia has about as much as Germany, Texas has nearly as much as Great Britain, Tennessee has more than twice as much as France, and Alabama 1400 more square miles of coal land than England. The 44,000 square miles of the whole of Europe, including 20,000 square miles of Russia, 4000 in Spain and 1800 in Austria, is only slightly more than half of the area of the Southern coal field.

These broad facts of the agricultural, forest and mineral resources of the South should command the attention of European homeseekers and investors.

# Potentialities of Southern States Emphasized in Contrast with Northern and Western States



NOTHING emphasizes more strongly the comparative virginity of the South from the standpoint of agriculture, manufacturing and mining with its consequent opportunities for millions of men of thrift and enterprise, than a consideration of the position gained by States in the North and West which, individually or in the aggregate, have not possessed the natural resources of States of like area or of much greater area in the South.

The accompanying map shows the outline of certain typical Northern and Western States compared or contrasted with those of eight Southern States. Facts not often borne in mind are brought out in a graphic way by this map. The general idea of the area of Texas is that it is an empire in extent. Few persons realize, however, that the whole of New England's territory multiplied by four might be included in Texas, and still nearly 15,000 square miles of that State will be unoccupied; that North Carolina has 1086 more square miles of area than New York, Alabama 6447 more than Pennsylvania and Georgia 17,985 more than Ohio; that Kentucky is five times as large as Massa-

square miles, an average of 108.9 persons to the square mile, the density by States ranging from 528.6 in Rhode Island to 22 in Maine. New England's population if transferred to Texas would average but 25.1 to the square mile, only a few more than the average density in Maine. When the density of population in Texas equals that of today in New England, Texas will have 28,575,142 inhabitants, a greater population by more than 1,000,000 than the population of the whole South in 1900.

North Carolina has an average of 46.6 persons to the square mile; New York, with less area, has more than four times the population of North Carolina and an average density of population of 198.9. North Carolina has no city with 50,000 inhabitants, but the growth of its urban and rural populations has been quite equable, while one-half of the population of New York State is within the narrow confines of New York city. And that is about twice the population of North Carolina.

The greater density of population and its stronger tendency to mass in great cities, making them greater in these Northern and Western States, is



chusetts, Florida more than seven times as large as New Jersey and Maryland more than nine times as large as Rhode Island. Louisiana's area is about 10,000 square miles less than that of Illinois.

The eight Southern States mentioned have an aggregate area of 571,534 square miles, more than twice the aggregate area of the eleven Northern and Western States mentioned.

Within this particular Southern area is a population of 17,355,000, an average of 30.4 to the square mile. The eleven Northern and Western States have an aggregate population of 37,427,000, an average of 144.6 to the square mile. Much of this latter density, to be sure, is accounted for by the inclusion in the aggregate population of the populations of Greater New York, Chicago, Philadelphia, Boston, Cleveland and Pittsburgh, ranking respectively first, second, third, fifth, sixth and eighth among the eight cities of the United States having more than 500,000 inhabitants, while the Southern area mentioned contains but one, Baltimore, and the six Northern and Western cities contain nearly one-third of the aggregate population in the eleven Northern and Western States. When the density of population in the Southern States shall equal 144.6 to the square mile, the eight States will have 82,643,816 inhabitants, or only 13,000,000 less than the present population of continental United States. Maryland is the only Southern State approaching such an average density, with 132.3 persons to the square mile, and about 43 per cent. of Maryland's population is in Baltimore city.

The Southern opportunity for home-seekers becomes most manifest in comparison of Texas and the six States of New England, or of North Carolina and New York. The 6,750,000 inhabitants of New England occupy 61,976

an evidence of a lack of natural resources calling for productive work, instead of that of the middle man; but, at the same time, a demonstration of what the South is to be when its natural resources for production shall be backed by vast capital and an increase in population, thus giving the momentum of more men and more money which in the Northern and Western States have wrought out material wealth often in the use of products of the South.

There is no other region in the world of like area equal to that of the South in its possibilities in agriculture. There may be grown practically every crop that is raised in any other part of the country, while in the growing of cotton, sugar cane, rice, peanuts and tobacco it has almost a virtual monopoly. These four crops, however, represent the greater portion of the \$1,699,322,000 of farm products in the eight States, an average of \$97.68 per each inhabitant, as compared with an average of \$53.67 per each inhabitant in the eleven Northern and Western States. In the Southern group, the capital invested in agriculture, including lands, buildings, implements and live stock, averages \$300 per each inhabitant, while in the Northern and Western group the average is \$258, in spite of the land and improvements being much more costly than in the South. Nevertheless, it is interesting to note that the gross returns upon the agricultural investment in New England are at a greater rate than such gross returns in Texas, a consequence of the ready markets in New England for crops yielding more per acre, food crops, than the field crops of Texas.

The thickly settled communities of New England exist and thrive in the face of nature's failure to endow much of that section with any great agri-



cultural potentialities. New England has been forced to become a manufacturing center. Its principal mineral resource is in its ribs of rock; its present forest area, 24,750,000 acres, is 5,000,000 less than that of Texas, and most of the cotton, leather, iron and other material for manufactures has to be brought great distances, together with the bulk of the foodstuffs for the workers. Yet, New England has \$2,503,855,000 invested in manufacturing, compared with \$1,521,133,000 of such capital in the eight Southern States, and is manufacturing annually to the value of \$2,670,065,000, as compared with the value of \$1,674,639,000 of products manufactured in the Southern group. Kentucky, having five times the area of Massachusetts, with 16,670 square miles of coal fields containing 104,000,000,000 tons of coal, 10,000,000 acres of forest land and fields producing cotton, tobacco and the staple crops, is manufacturing less than one-sixth as much as Massachusetts and is supporting 1,163,000 fewer inhabitants.

Rhode Island's whole population of 564,000 is only a few thousand greater than the population of Baltimore city, the manufacturing center of a State rich in forest, mineral and agricultural resources, but the manufactured products of Rhode Island average \$496 for each inhabitant, while those of Maryland average but \$240.

Of the Northern States, New Jersey may be regarded as a typical market garden. It has New York and Philadelphia close at hand calling for food. It has its own manufacturing centers equally vociferous. It is not surprising, therefore, that its agricultural products have an annual value nearly twice that of the Florida production. But Florida can raise citrus fruits beyond the dreams of New Jersey, and the area in the State suited to the growth of early and high-priced fruits and vegetables has hardly begun to be occupied. New Jersey produces \$15 in manufacturing to every dollar it produces in agriculture. Florida's manufacturing production has a value less than New Jersey's agricultural production and is yet only about \$1.70 to every dollar of its agricultural production. The promise for Florida full of opportunity for manufacturing and agriculture, appears in an increase between 1900 and 1909 of capital invested in factories at the rate of more than 153 per cent., the growth of factories adding home markets to those in other parts of the country now depending upon Florida.

Separated by about 300 miles in the Mississippi valley are Louisiana and Illinois. In the former 10,519,000 acres of its total area of 29,061,760 acres are occupied as farms and of its farm area only 50 per cent. is improved. The farm area of the latter is 32,523,000 acres in a total area of the State of 35,841,000 acres, and 86 per cent. of the farm acreage is improved. The improved acreage in Illinois is more than two and a half times the total farm acreage of Louisiana, and the average value per acre in 1910 was \$95.02, as compared with an average of \$17.99 in Louisiana. Last year Illinois raised 428,452,000 bushels of corn and Louisiana 33,815,000 bushels. For the cost of one acre in Illinois more than five acres equally fertile in Louisiana can be bought capable, as has been demonstrated to the satisfaction of corn growers of the upper valley, of producing not only

## TYPICAL STATES COMPARED.

Eight Southern States.		Eleven Northern and Western States.	
Area, square miles.....	571,534		258,759
Population (1912).....	17,355,000		37,427,000
Railroads, miles (1912).....	50,370		52,380
Factory capital (1900).....	\$1,521,133,000		\$11,858,434,000
Factory products (1909).....	\$1,674,639,000		\$13,169,039,000
Mineral products (1910).....	\$131,156,000		\$1,052,859,000
Farm capital (1910).....	\$5,211,414,000		\$9,634,846,000
Farm products (1912).....	\$1,699,322,000		\$2,006,793,000
Texas.		New England.	
Area, square miles.....	262,398		61,976
Population.....	4,064,000		6,750,000
Railroads, miles.....	15,843		8,400
Factory capital.....	\$216,876,000		\$2,503,855,000
Factory products.....	\$272,896,000		\$2,670,065,000
Mineral products.....	\$18,383,000		\$25,963,000
Farm capital.....	\$2,218,645,000		\$867,241,000
Farm products.....	\$607,830,000		\$302,682,000
Kentucky.		Massachusetts.	
Area, square miles.....	40,181		8,039
Population.....	2,317,000		3,480,000
Railroads, miles.....	3,976		2,125
Factory capital.....	\$172,779,000		\$1,279,087,000
Factory products.....	\$223,754,000		\$1,490,529,000
Mineral products.....	\$21,513,000		\$2,147,000
Farm capital.....	\$773,798,000		\$226,474,000
Farm products.....	\$219,073,000		\$62,289,000
Maryland.		Rhode Island.	
Area, square miles.....	9,941		1,067
Population.....	1,315,000		564,000
Railroads, miles.....	1,615		212
Factory capital.....	\$251,227,000		\$290,901,000
Factory products.....	\$315,669,000		\$280,344,000
Mineral products.....	\$15,440,000		\$801,000
Farm capital.....	\$286,167,000		\$32,991,000
Farm products.....	\$73,268,000		\$8,315,000
North Carolina.		New York.	
Area, square miles.....	48,740		47,654
Population.....	2,270,000		9,480,000
Railroads, miles.....	5,574		8,520
Factory capital.....	\$217,186,000		\$2,779,497,000
Factory products.....	\$216,656,000		\$3,369,490,000
Mineral products.....	\$2,616,000		\$74,520,000
Farm capital.....	\$537,716,000		\$1,451,481,000
Farm products.....	\$188,665,000		\$353,823,000
Alabama.		Pennsylvania.	
Area, square miles.....	51,279		44,832
Population.....	2,200,000		7,840,000
Railroads, miles.....	5,421		11,600
Factory capital.....	\$173,180,000		\$2,749,006,000
Factory products.....	\$145,962,000		\$2,626,742,000
Mineral products.....	\$47,751,000		\$591,603,000
Farm capital.....	\$370,138,000		\$1,253,275,000
Farm products.....	\$184,186,000		\$324,397,000
Louisiana.		Illinois.	
Area, square miles.....	45,409		56,043
Population.....	1,710,000		5,800,000
Railroads, miles.....	5,392		12,150
Factory capital.....	\$221,816,000		\$1,548,171,000
Factory products.....	\$223,949,000		\$1,919,277,000
Mineral products.....	\$10,120,000		\$141,809,000
Farm capital.....	\$301,221,000		\$3,905,321,000
Farm products.....	\$113,421,000		\$560,698,000
Georgia.		Ohio.	
Area, square miles.....	58,725		40,740
Population.....	2,685,000		4,890,000
Railroads, miles.....	7,442		9,400
Factory capital.....	\$202,778,000		\$1,300,733,000
Factory products.....	\$202,863,000		\$1,437,936,000
Mineral products.....	\$6,048,000		\$188,075,000
Farm capital.....	\$580,546,000		\$1,902,695,000
Farm products.....	\$269,220,000		\$388,458,000
Florida.		New Jersey.	
Area, square miles.....	54,861		7,514
Population.....	794,000		2,667,000
Railroads, miles.....	5,107		2,310
Factory capital.....	\$65,291,000		\$977,172,000
Factory products.....	\$72,890,000		\$1,145,529,000
Mineral products.....	\$9,285,000		\$30,889,000
Farm capital.....	\$143,183,000		\$254,833,000
Farm products.....	\$43,659,000		\$76,735,000

corn, the great crop of Illinois, but cotton, rice, sugar cane and other crops foreign to Illinois. The high price of lands in such States as Illinois and Ohio reflected in the fact that the gross returns upon agricultural investment in Louisiana are at a rate more than twice as great as such returns in Illinois, is directing the attention of Western farmers to the lands of the South.

Pennsylvania's possession of 133,574,000,000 tons of coal underlying 14,680 square miles of its area, together with its reserves of iron ore and its petroleum, determined it as a manufacturing State, and it began early to work out its destiny. With 6,000 square miles more of territory, but lying in a region included in the cotton belt, Alabama was slower in entering upon its industrial career, although it possessed 68,903,000,000 tons of coal, and iron ore deposits, the extent of which has not yet been measured. But Alabama is now mining about as much bituminous coal as Pennsylvania mined in 1880 and in 1910 made as much pig iron as Pennsylvania made in 1880, although the population of Pennsylvania in 1880 was twice the population of Alabama in 1910. Moreover, while the capital invested in agriculture in Pennsylvania is nearly three and a half times as great as that in Alabama, the value of farm products in Pennsylvania is less than twice that in Alabama. Agriculture and manufacturing going hand in hand have brought Pennsylvania to a high state of development, but it has for years been under compulsion to send to other States for its iron ore, it will soon yield the palm to a Southern State in production of coke for iron making, and 12,674,000 of the 18,587,000 acres of its farm lands, or 68 per cent., are under cultivation, while practically only a beginning has been made in utilization of Alabama's mineral resources and less than half of its 21,000,000 acres of farm land are under cultivation with other millions still to become farms.

Alabama, in contrast with Pennsylvania, with its mineral, timber and agricultural wealth still to be realized, is a fair sample of the South as a whole, in comparison with the rest of the country, and an epitome of the vast opportunities in the South for men of other sections and of other lands.

As a whole, and in proportion to its area and its population, the South is far ahead of the whole country thirty years ago in many particulars, and it is fortunate in being in a position to avail itself in further development of the experience which has been gained at great cost by other sections while it lay comparatively fallow. While more than one of the eleven States of the North and West mentioned have reached the limits of their productivity dependent upon natural resources, not a single Southern State has yet approached such a limit. The utilization of some of the great resources in many of the Southern States ends with the mining of the coal or the iron ore and the sawing of the lumber to be sent to other States for use in manufacturing. More men and more money are the essentials to the proper and complete handling of these resources, and the latter is bound to attract the former in ever-increasing volume as each success in investment advertises the opportunities for further investment.

# Forecast of Southern Production in 1944 Based Upon Comparison of the South in 1912 and the Whole Country in 1880



**E**MPHASIZING the advanced position of the South in 1912 beyond that of the whole country in 1880 is the accompanying diagram comparing the area of the 16 Southern States with that of the United States.

The South has a land area of 945,088 square miles—less than 32 per cent. of the 2,974,159 square miles of the land area of the country.

With a population of 50,396,000, or one and a half times as great as the present population of the South, the whole country, more than three times as large, was producing in 1880 less than the South is producing today in a number of lines of manufacturing, farming, lumbering and mining.

In proportion to population and to area the South today is accomplishing in practically every great domain of material activity more than the whole country in 1880.

If the rates of increase for the whole country in the several lines of industry during the past 32 years shall be maintained in the South during the next 32 years—and the belief that such will be the case is warranted by the South's possession of vast resources and great opportunities—the South of 1944 will equal the United States of today in many respects and surpass the whole country in others, and that, too, even with the South having then a population 30,000,000 less than the population of the United States in 1912.

This forecast is justified by the facts

## WHERE THE SOUTH IN 1912 SURPASSED THE WHOLE COUNTRY IN 1880.

	United States—1880.	The South—1912.*
Population .....	50,396,000	33,475,000
Land area—square miles...	2,974,159	945,088
Capital in manufactures....	\$2,790,273,000	\$3,500,000,000
Capital in cotton mills.....	\$208,000,000	\$300,000,000
Active spindles in cotton mills .....	10,653,000	11,859,000
Active looms in cotton mills.	226,000	252,000
Pounds of raw cotton used..	750,344,000	1,319,708,000
Tons of coke made.....	3,338,000	7,974,000
Feet of lumber cut.....	18,125,432,000	20,000,000,000
Value of forest products....	\$388,781,000	\$652,153,000
Value of agricultural products .....	\$2,212,541,000	\$3,297,000,000
Value of mineral products..	\$364,928,000	\$385,700,000
Tons of coal mined.....	71,482,000	132,000,000
Barrels of petroleum produced .....	26,286,000	84,800,000
Tons of phosphate mined...	211,000	3,400,000
Tons of sulphur mined.....	536	787,000
Tons of zinc spelter produced .....	23,239	132,000
Tons of primary lead produced .....	98,000	190,000
Barrels of Portland cement.	42,000	11,000,000
Individual deposits in National Banks.....	\$873,538,000	\$1,059,068,475
Expenditures for common schools .....	\$78,095,000	\$90,000,000

\*Partly estimated. †Not including animals sold or slaughtered.

emerging from a study of the actual figures of 1880 in comparison with figures of 1912, conservatively estimated in part.

The key-fact, perhaps, is in the banking situation. In the National banks in the South there were last year \$1,059,068,000 of individual deposits, or \$185,530,000 more than such deposits in all the National banks of the country in 1880, and the aggregate of \$2,322,901,762 individual deposits in all the financial institutions of the South was \$130,272,000 greater than the country's total 32 years earlier. The National banks of the South had in 1912 aggregate resources amounting to \$2,112,717,000, an average of \$63.11 to each inhabitant; those of the whole country in 1880 had \$2,105,787,000, an average of \$41.78 only. This banking strength and the more than \$2,000,000,000 individual deposits in banks and trust companies reflect the results of the notable material progress of the South and guarantee a greater advance in wider areas.

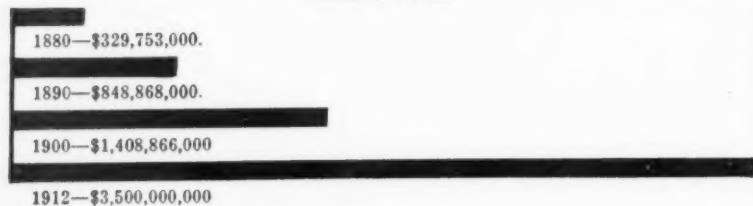
As many of the growths in Southern materialities between 1880 and 1912 were almost from the ground up, it was physically impossible for all of them to reach proportions equal to those of the whole country, which for the most part had had an enormous advance in the 15 or 20 years during which those in the South had been comparatively dormant. The same fact accounts for the remarkable rates of increase in the South in a generation, and, therefore, calls for a use of the more normal rates of increase in



# Diagrammatic Exposition of Southern Material Advancement

## CAPITAL IN MANUFACTURING.

THE SOUTH.



UNITED STATES



## VALUE OF MINERAL PRODUCTS.

THE SOUTH.

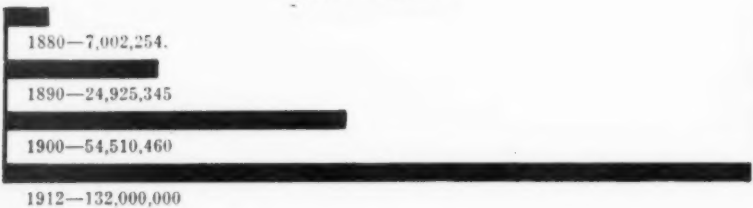


UNITED STATES



## TONS OF COAL MINED.

THE SOUTH.



UNITED STATES.



## BARRELS OF PETROLEUM PRODUCED.

THE SOUTH.

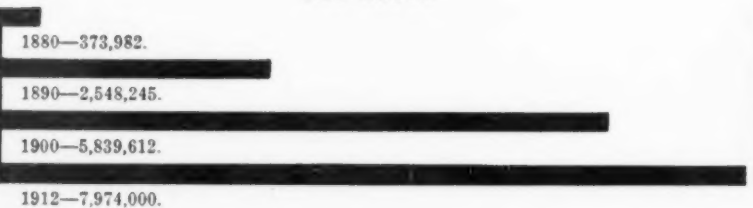


UNITED STATES.

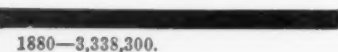


## TONS OF COKE MADE.

THE SOUTH.

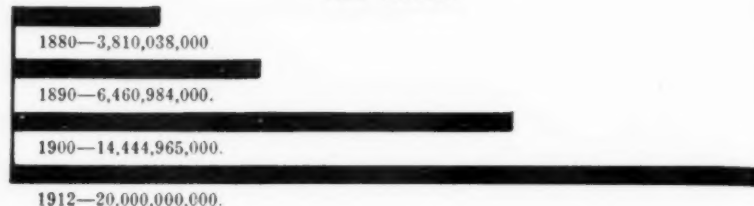


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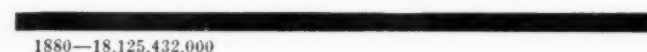


## FEET OF LUMBER CUT.

THE SOUTH.

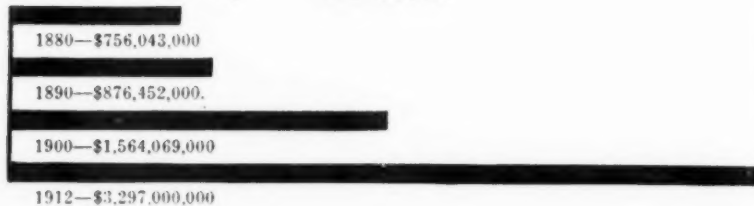


UNITED STATES

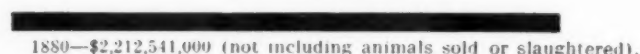


## VALUE OF AGRICULTURAL PRODUCTS.

THE SOUTH.



UNITED STATES



## NUMBER OF ACTIVE COTTON SPINDLES.

THE SOUTH.

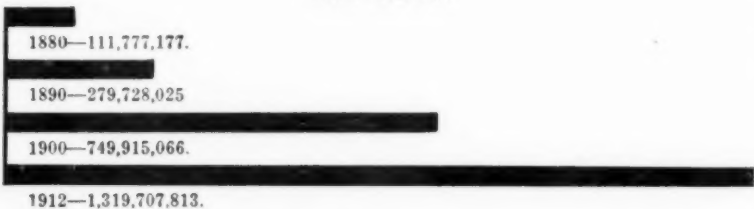


UNITED STATES.



## POUNDS OF COTTON USED BY MILLS.

THE SOUTH.



UNITED STATES.



## INDIVIDUAL DEPOSITS IN NATIONAL BANKS.

THE SOUTH.



UNITED STATES.



the whole country in that period as a basis for an estimate of the possible increases in the South in the next 30-odd years. The positive advances by the South beyond the position of the whole country in 1880 are indeed notable in themselves, especially in view of the much smaller area of the South and the number of its inhabitants.

The whole country in 1880 had \$2,790,273,000 invested in manufactures, including hand trades and neighborhood industries. The latest official figures, those of 1909, deal only with factories, and do not include hand trades and neighborhood industries, but in that year the capital invested in Southern factories amounted to \$2,883,929,000, or \$93,656,000 more than the whole manufac-

than the country's production of \$364,928,000 in 1880. Last year's Southern value was several millions more than that of 1910.

Among the details of actual increases in production in the South today over the whole country 30 years ago are \$186,000,000 more of individual deposits in National banks, more than twice as many tons of coke, about one and three-fourths times as much coal and nearly four times as much petroleum.

Mining of phosphate rock has been carried on commercially less than 50 years, and has been confined principally to the South, the increase between 1880 and 1912 having been from 211,000 tons to 3,400,000 tons. At the earlier date the whole country mined only 536 tons of sulphur. Today one Southern

### WHAT THE SOUTH WILL BE IN 1944 WITH A RATE OF INCREASE EQUAL TO THAT OF THE UNITED STATES SINCE 1880.

	The South 1912.*	United States 1880.	Increase per cent. United States 1880-1912.	The South in 1944 if like rate of increase is maintained.
Population .....	33,475,000	50,396,000	90.3	63,703,000
Manufactures:				
Capital .....	\$3,500,000,000	\$2,790,273,000	652.7	\$26,345,000,000
Products, value.....	\$3,900,000,000	\$5,369,579,000	328.3	\$16,704,000,000
Cotton Mills:				
Capital .....	\$300,000,000	\$208,000,000	308.6	\$1,226,000,000
Active spindles.....	11,358,600	10,653,000	183.5	33,617,000
Active looms.....	252,000	226,000	214.1	792,000
Cotton used, pounds.....	1,319,708,000	750,344,000	245.	4,553,000,000
Pig iron made, tons.....	3,054,980	3,835,000	675.1	23,679,000
Coke made, tons.....	7,974,000	3,338,000	1,218.1	105,000,000
Lumber cut, feet.....	20,000,000,000	18,125,432,000	115.1	43,000,000,000
Forest products, value.....	\$652,153,000	\$388,781,000	208.7	\$2,013,000,000
Agriculture:				
Capital .....	\$12,102,000,000	\$12,104,000,000	271.8	\$45,000,000,000
Products, value.....	\$3,297,000,000	†\$2,212,541,000	330.8	\$14,203,000,000
Cotton crop, running bales.....	14,082,000	5,756,726	144.9	34,500,000
Grain:				
Corn .....	1,135,939,000	1,717,435,000	84.5	2,096,000,000
Wheat .....	98,086,000	498,550,000	44.3	141,400,000
Oats .....	137,865,000	417,885,000	238.9	467,700,000
Livestock:				
Cattle .....	20,718,000	34,932,000	65.9	34,371,000
Sheep .....	8,975,000	42,192,000	24.1	11,138,000
Swine .....	25,075,000	47,682,000	37.2	34,405,000
Mineral products, value.....	\$385,700,000	\$364,928,000	475.4	\$2,219,000,000
Coal mined, tons.....	131,900,000	71,482,000	593.2	913,400,000
Petroleum produced, barrels.....	84,800,000	26,286,000	746.1	717,000,000
Phosphate mined, tons.....	3,400,000	211,000	1,511.3	54,784,000
Zinc spelter, tons.....	132,000	23,239	1,139.1	1,636,000
Primary lead, tons.....	190,000	98,000	338.7	834,000
Railroads, miles.....	90,930	93,000	168.8	244,000
Exports .....	\$769,679,000	\$835,639,000	163.8	\$2,031,000,000
National Banks:				
Resources .....	\$2,112,716,913	\$2,105,787,000	420.7	\$10,998,000,000
Capital .....	\$242,799,990	\$466,365,000	124.1	\$543,800,000
Individual deposits.....	\$1,059,068,475	\$873,538,000	580.8	\$7,210,000,000
Other individual deposits.....	\$1,263,836,287	\$1,319,095,000	748.9	\$10,730,000,000
Common schools, expenditures.....	\$90,000,000	\$78,095,000	463.4	\$507,000,000
Property, true value.....	\$28,000,000,000	\$44,000,000,000	213.7	\$87,000,000,000

\*Partly estimated. †Not including animals sold or slaughtered.

turing capital of the country 29 years before. The total manufacturing capital of the South today is easily \$3,500,000,000.

That invested in cotton mills is \$300,000,000, or nearly \$100,000,000 more than the same kind of capital in the whole country in 1880; the number of active spindles in the South, 11,358,600, is 1,205,165 more; the active looms 26,000 more, and pounds of cotton used, 1,319,708,000, are 569,364,000 more than in the whole country 33 years ago. In 1910 the South cut 21,235,437,000 feet of lumber, or 3,110,005,000 more than the cut of the country in 1880.

In that year the country's farm products, not including cattle slaughtered on farms or sold for slaughter, had a value of \$2,212,541,000. The 1912 cotton crop, including seed, of the South was worth \$1,000,000,000 by itself, and that year's total agricultural production had a value not less than \$3,290,000,000.

In 1910 the South's mineral production reached a value of \$4,750,000 greater

State—Louisiana—alone is producing yearly 787,000 tons, and the South's proportion is destined to become greater with the development of sulphur deposits in Texas, begun last year.

Another industry, like sulphur mining, phosphate mining and the naval stores industry, practically monopolized by the South, is cottonseed crushing. The beginnings of this date back nearly 30 years before 1860, but its real growth has been from an annual production of \$7,691,000 in 1880 to quite \$145,000,000 in 1912.

Production of lead and of zinc in one Southern State—Missouri—is largely responsible for a Southern production today of nearly six times as much zinc spelter and nearly twice as much primary lead as the whole country produced in 1880.

The manufacture of Portland cement is almost a creation of the past 30



years. In 1880 the whole country made 42,000 barrels; in 1912 the South made 11,000,000 barrels.

In comparison with population the South today is far ahead of the country in the particulars that have been cited, and it is also in advance in other lines.

The United States in 1880 produced in manufacturing an average of \$106.33 for each inhabitant; such production today in the South averages \$116.50.

In 1910 the South made 3,447,000 tons of pig-iron, an average of one ton to each 9.4 of the inhabitants; the 3,835,000 tons made by the country in 1880 was an average of one ton to every 13.1 of the inhabitants. The production of 3,054,980 tons in the South in 1912 was a greater average in proportion to population than the country's average 32 years before.

In the same proportion the South has one and a half times as much capital in farming, representing the value of land, buildings, live-stock and implements, as the whole country had in 1880, and the South's railroad mileage is more than double that of the whole country in 1880 in proportion to total area, the South having one mile of railroad for every 13.9 square miles of area, against one mile of railroad for every 31.9 square miles of area in the country in 1880.

Stripped almost bare of capital by the war and reconstruction, and loaded with appalling burdens, the South was more than 20 years behind the rest of the country in beginning the accumulation of the form of capital appearing in National bank resources. Nevertheless, such resources in the South increased between 1880 and 1912 from \$194,084,459 to \$2,112,716,000, nearly eleven times, and reached a total \$6,930,000 greater than the total in the whole country in 1880. But in proportion to population the South has in National bank resources an average of \$21.33 more per each inhabitant than the whole country had at the earlier date. Individual deposits in national banks in the South are \$185,530,000 greater than those of the whole country in 1880; but, although individual deposits in other Southern financial institutions are \$55,259,000 less than deposits in such institutions in the country in 1880, the average in the South today is \$11.58 more per each inhabitant than the average in the whole country 30 years ago.

In spite of the many drawbacks of its own, the South has been increasing its importance as a contributor to the growth of wealth of the whole country. For instance, the South has had in its cotton crop a foundation not only of a great world-wide manufacturing industry second only to that of iron and steel, but also of international trade. Since 1880 the value of the exports of the South's raw cotton has amounted to \$9,685,855,000, or nearly 24 per cent. of the value of all the exports from the country in that period, and \$2,051,749,000 more than the value of the output of all the gold mines of the world in the same time. The direct and indirect contributions of the South to the export trade of the country have steadily increased until today 45.5 per cent. of such exports are based upon Southern production of cotton, cottonseed oil, meal and cake, phosphate rock, naval stores, lumber and its manufactures, tobacco, petroleum, coal, foodstuffs, iron and steel and miscellaneous goods. The value of exports from Southern ports in the past fiscal year was within \$65,960,000 of the value of exports from all ports of the country in 1880. But the 1912 exports from Southern ports averaged nearly \$23 per each inhabitant, against an average per each inhabitant of about \$16 in the whole country in 1880.

The remarkable progress of the South recorded in these figures and graphically shown by the diagrams accompanying this article justifies, in the light of the increasing calls upon the South's resources for agriculture, manufacturing and commerce, the forecast of the attainments of the South by 1944 indicated statistically on the preceding page. Conviction on that point is strengthened by a realization of the cumulative momentum that the South has already received and is receiving and of the tremendous advantages accruing in labor-saving machinery and time-saving devices that have been tried out successfully elsewhere.

The estimate of the South's population 32 years from now, 63,703,000, would involve an increase about 1,000,000 more than the increase in the whole country between 1860 and 1890, a period in which the four years' war was a decided check upon growth of population. It was a period, too, in which the flood of immigration from foreign lands swelled from 150,237 to 455,302 annually, foreshadowing the high-water mark of 1,285,349 in 1907, and accounting directly and indirectly for probably one-third of the total increase of population in the country. The South received comparatively little of this foreign immigration, and, indeed, suffered from a movement of thousands of its population to other parts of the country every year, checking the growth of its population directly and indirectly by several millions. In the depressed conditions in the South in that day hundreds of thousands of the younger men felt that there were better opportunities for them in the North and West, and so they cast their lots with those sections, and many of them attained eminence as they contributed to the development of the country.

But conditions have changed. Natives of the South perceive that there they have better opportunities than anywhere else in the world. They are staying at home to welcome the hundreds of thousands of men from other sections that are bound to come to the South under the pressure of congesting populations in the North and West and following the lines of least resistance and of greatest attraction. Speaking generally, the best lands elsewhere have now been possessed, and command such high prices that their owners can well afford to sell them and to invest part of the proceeds in larger tracts in the South of greater productive capacity.

Such a policy, which is, indeed, already being carried out, is bound to swell the volume of capital in agriculture in the South. The average of part of that capital represented in land and improvements was \$23.36 per acre in the South in 1910, against an average of \$52.51 in the rest of the country. The increase in the cultivated area of present farm acreage and additions to that acreage from timber land and reclaimed land will not bring up the farm acreage of the South to an equality with the acreage in the whole country today, but the enhancement of values and the betterments in the shape of up-to-date buildings, improved machinery and live-stock should certainly give the South an agricultural capital of \$45,000,000,000, while the improved methods of agriculture now given wide encouragement throughout the South and bringing about a greater yield per acre should mean an annual gross income from Southern farms of \$14,203,000,000, or nearly \$5,000,000,000 more than the yield from all the farms of the country today.

Necessity for such agricultural activity will be pressed in upon the South by the demands of a greater population engaged in manufacturing. As to capital invested, the whole country is producing less today than in 1880, dollar for dollar. Notwithstanding the economies consequent upon the introduction of labor-saving machinery in industrial operations, their products do not represent today in value as large returns upon capitalization as they did 30 years ago. Between 1880 and 1909 the gross production per each dollar of capitalization was reduced by 80 cents in the whole country and by 79 cents in the South. In the meantime, however, the South has been gradually modifying its manufacturing energies in the direction of making finished products rather than supplying to other sections the materials for such. It is turning out a larger proportion of cotton cloths and other goods, more iron and steel products, instead of pig-iron; more furniture and agricultural implements, instead of planks and boards. It has nearly 250 samples of what it can manufacture on distinct lines, and its peculiar advantages as to propinquity of the raw materials for manufacturing, as to fuel and as to widening markets are an irresistible invitation to man and money to participate in the benefits to be derived from making facts of the South's industrial possibilities. Should the history of the whole country of the past 32 years in rates of increase be repeated in the South in the next 32 years, the South would still be producing in manufacturing \$7,000,000,000 less than the country today, though in some lines it would be in advance. It is quite reasonable to expect a cotton-mill equipment in the South then greater than that of the country now. As the South has the country's great reserve, 75 per cent. of coal, suitable for coke to be used in iron manufacture, coke must be produced not merely to supply Southern ironmasters turning out at least 23,000,000 tons of pig-iron, but those of other sections compelled to draw upon the South for the material if their plants are not dismantled and their activities transferred to the South. So, too, the forests of the South must meet the demands of the whole country for lumber, and it will require the most businesslike handling of the forests if the South's annual cut in 1944 is to reach 43,000,000,000 feet, something more than double its production today, without impairing materially its ability to continue to supply the demand.

The forests should be handled as the intelligent far-sighted farmer handles his land, and similar care for the future should be exercised in the mineral industries. Coal and petroleum and natural gas and phosphate and lead and zinc and sulphur are not reproductive. Once utilized, they cannot be replaced. In some cases there is little occasion for apprehension that the South will not be able to meet expectations in mineral production; in others, the 1944 estimates are perhaps beyond what the facts will be. An output of 54,784,000 tons of phosphate is hardly conceivable in view of a total output of 41,000,000 tons in the past 33 years in the South and of the tendency toward exhaustion of supply in regions where the earlier exploitations were made. It is impossible, though, to estimate the phosphate rock resources of the South, just as the volumes of petroleum and of natural gas are unknown quantities. But the supply of rock salt and of sulphur, of building stone and of clays is practically inexhaustible, while the proving six months ago of a new vast iron-ore field in the Birmingham district points to the uncovering of other fields of that ore, as well as of lead, zinc, copper and other minerals. But with an available supply at present of 530,000,000 tons of coal the South may easily be mining 913,000,000 tons, or less than double the country's production today, and the industrial and transportation interests of the section in 1944 will in all probability call for such an output.

It may be expected that the various energies of the fully developing South 32 years from now will need a railroad mileage equal to that of the country today and also equal financial resources. The estimate based upon the rates of increase for the whole country in the past 32 years gives the South an aggregate of National bank resources a few million dollars more, the South's National banking capital being then about half of the present capital of the kind in the whole country. It is quite safe, however, to forecast a greater rate of increase in National banking capital in the South than has recently prevailed in the country, and it has been indicated already in an increase between 1900 and 1912 of nearly 127 per cent. in the South, against an increase of about 64 per cent. in the whole country. Likewise, the actual wealth of the South should in 1944 be at least \$87,000,000,000, which would be less per capita in the South than in the United States today, whereas it is almost certain that the per capita wealth of the South at that time will very much exceed the per capita wealth of the country today. These figures are, to be sure, mere estimates, but they are put forth in the confidence born of acquaintance with the achievements of the South of the recent past and of knowledge of its wonderful natural wealth.

# Cotton: The Southern Woof in the Warp of American Agriculture, Manufacturing and Commerce



COMPLETING the fabrication of the material wealth of the United States is the mighty woof of the South's cotton crop, with its many strands across and through the warp of American agriculture, manufacturing and commerce. Produced upon 35,000,000 acres, or 11.9 per cent. of the 294,343,000 acres devoted to twelve leading crops of the country in 1912, the cotton crop, including its seed, in that year had a value of \$1,000,000,000, equal to 20.4 per cent. of the aggregate value, \$4,906,449,000, of those crops. Upon something more than one-eighth of the land devoted to those crops in the whole country, the South produced one crop, cotton, having a value more than one-fifth of the aggregate value of the twelve crops.

In the last census year, 1909, the value of all factory products in the United States was \$20,672,052,000. In that year the value of the outputs of blast furnaces and iron and steel works and rolling mills was \$1,377,152,000, and the value of cotton goods, including hosiery and knit goods, and of primary products of cottonseed, was \$915,070,000. In the first-named industries 278,505 wage-earners were employed, and in the second group, 474,701.

The value of merchandise exported from the United States in the fiscal year ended June 30, 1912, was \$2,204,322,409. Of the total, raw cotton represented \$565,849,271, manufactures of cotton \$50,769,511 and \$42,142,181 cottonseed and its products, an aggregate of \$658,760,963 representing products of the cotton plant, and 29.9 per cent. of the total value of all merchandise exports from the country. The value of these exports, based upon one Southern crop, was nearly two and a half times as great as the value of the exports of iron and steel.

In the thirty-three years between 1880 and 1912 there was exported from the United States merchandise to the value of \$39,151,828,195, and of that total, \$9,685,282,138, or 24.7 per cent., was the value of Southern cotton exported.

In the cotton year ended with last August, 140,996,000 active spindles in the cotton mills of the world consumed 20,402,000 bales of 500 pounds net. To meet that consumption the world's cotton fields produced 22,297,000 bales, or, eliminating the 650,000 bales consumed in household manufactures in British India, 21,647,000 bales. To that supply the cotton fields of the South contributed 15,100,000 bales, with more than a million bales remaining with manufacturers and warehouses at the close of the season. The large proportion of the South's contribution to the world cotton crop, ranging from 65 to 75 per cent., has been maintained for many years. The importance of that production appears in the fact that in no year since 1880 has the combined output of all the gold mines and silver mines in the world equaled in value the value of the South's cotton crop, with its seed, and in only five of the thirty-three years was the output of all the gold mines in the world sufficient to pay for the cotton exported from the United States.

In the thirty-three years the cotton crops of the South, including seed, had an aggregate value of \$16,452,000,000, the output of all the gold mines in the world was worth \$7,634,105,600, and the output of all the silver mines was worth \$3,459,909,642. The thirty-three cotton crops had a value \$8,817,894,400 greater than the thirty-three years' gold production in the world, and \$5,357,984,758 greater than the combined gold and silver production.

In the same period the value of exports of raw cotton from the South reached the sum of \$9,685,854,574, or \$2,051,748,974 greater than the value of the world's gold production in the same time.

Merchandise exports from the United States in the thirty-three years had an aggregate value of \$39,151,828,195, and merchandise imports to this country

a value of \$29,989,425,250, a difference in favor of exports of \$9,162,402,945. That sum was \$523,451,629 less than the value of the raw cotton exported from the South.

Southern cotton fields now represented in 30 per cent. of annual export merchandise values are thus strikingly shown to be an essentially important factor, not only in the agriculture of the United States, in the manufacturing industries and the commerce of the world, but in the basis of exchange, inasmuch as the raw cotton exported from the South since 1880 has brought back to this country practically \$10,000,000,000 in gold or credits.

The crop of cotton, with its seed, raised from the 1911 planting in the South, was worth \$938,900,000, or \$356,558,000 more than the combined output of the gold and silver mines and more than twice as much as the gold produced in the whole world in that year.

The time will come when gold mines and silver mines may be exhausted. Quite a large amount of the increased production of gold in the past ten years has come about through the application of new methods in deriving the metal rather than through the opening of new mines or the extension of operations in old ones. The value of gold mined in Alaska, for instance, which increased from \$762,000 in 1890 to \$8,166,000 in 1900 and to \$22,036,794 in 1906, fell to \$16,665,200 in 1911, while the increase in world production between 1906 and 1911, as far as mining was concerned, was most marked in South Africa. Against the possibility of the exhaustion of these mineral sources of wealth stands the vast potentiality of the South's cotton fields as producers of wealth.

Cotton has been raised in every Southern State. The region in which climatic conditions and soil render it profitable to raise cotton embraces twelve of the Southern States and the southern portions of Virginia, West Virginia, Kentucky and Missouri, an area of 533,000,000 acres of land. Of that area 328,000,000 acres, or 61 per cent., are in farms, and of the farm lands only 138,000,000 acres, or 42 per cent., are cultivated. About one-fourth of the cultivated acreage and only something more than one-tenth of the total farm acreage is devoted to cotton. Several million acres included in farm lands of the present may be added to the cotton-growing acreage, and there are other millions of acres that have never felt the plow which are also available. There are 30,000 square miles of alluvial wet lands in the lower Mississippi Valley which when reclaimed at a comparatively small cost are capable of yielding a bale of cotton to the acre, or a total crop greater than any which has ever

been raised in the whole South. The average production for the South has ranged from a third of a bale to half a bale per acre in recent years, but renewed interest in perfecting cultural methods is tending to increase the average, and widespread competition is demonstrating the capabilities of the soil.

In a contest last year in Texas, for example, the first prize winner made 2.38 bales on an acre of land, and the average for all the contestants was 1.04 bales to the acre. Had that average prevailed in the State as a whole, the Texas cotton crop would have been in the neighborhood of 10,000,000 bales. In other States records have been made far above the average yield, the Sea Islands of South Carolina and Georgia no longer are the only regions where the long-staple cotton is raised in the South, the development of early maturing varieties is becoming the means of combating the boll-weevil and a deeper appreciation of the importance of intensive cultivation is tending to bring about a condition in which the most shall be made of every acre. The day of that ideal will be hastened by the introduction of mechanical devices in the

## VALUE OF COTTON CROP WITH SEED COMPARED WITH VALUE OF GOLD AND SILVER PRODUCED BY DECADES AND IN THIRTY-THREE YEARS.

Year ended August 31.	Cotton crop, with seed, value.	Year ended Dec. 31.	Gold produced, value.	Silver produced, bullion value.
1879-1880.....	\$325,000,000	1879	\$108,778,800	\$83,601,097
1889-1890.....	411,000,000	1889	123,489,200	112,412,950
1899-1900.....	416,000,000	1899	306,724,100	101,261,711
1909-1910.....	903,000,000	1909	454,145,700	109,865,919
1911-1912.....	938,900,000	1911	462,703,900	119,638,100

South's cotton crops, including seed, in 33 years, value.....	\$16,452,000,000
World's production of gold and silver in 33 years, value.....	\$11,094,015,242
Excess of cotton value over gold and silver value in 33 years.....	\$5,357,984,758

## VALUE OF RAW COTTON EXPORTED COMPARED WITH VALUE OF GOLD PRODUCED BY DECADES AND IN THIRTY-THREE YEARS.

Year Ended August 31.	Raw Cotton Exports.	Year Ended December 31.	Gold Value.
1880.....	\$209,852,005	1879	\$108,778,800
1890.....	250,569,334	1889	123,489,200
1900.....	245,652,268	1899	306,724,100
1910.....	460,710,176	1909	454,145,700
1912.....	563,543,430	1911	462,703,900

Exports of the South's raw cotton in 33 years, value.....	\$9,685,854,574
World's output of gold in 33 years, value.....	\$7,634,105,600
Excess of cotton exports value over gold output in 33 years.....	\$2,051,748,974

## PROPORTION OF RAW COTTON EXPORTS IN EXPORTS FROM THE SOUTH AND IN TOTAL EXPORTS FROM THIS COUNTRY BY DECADES.

Fiscal Year Ended June 30.	Exports of Raw Cotton.	Exports from Southern Ports.	Total Exports from United States.
1880.....	\$211,535,905	\$264,905,753	\$835,638,658
1890.....	250,968,792	311,742,748	857,828,684
1900.....	241,832,737	484,651,682	1,394,483,082
1910.....	450,447,243	628,529,790	1,744,984,720
1912.....	565,849,271	769,678,632	2,204,322,409

Total in 33 years. \$9,685,282,138 \$13,629,517,672 \$39,151,828,195



harvesting of the crop, economizing human power and permitting a cultivation later on of a wider acreage which will be called for by the demand for the staple.

Southern cotton mills alone are now consuming annually more cotton than the South produced in 1868. The war period resulted in a falling off in the annual Southern crop from 3,849,469 bales in 1860-61 to 2,097,254 bales in 1866-67. Since that time the volume of the crop has increased, at first slowly to 5,706,165 bales in the season of 1884-85, but more rapidly since the beginning of the present century, from 9,436,416 bales in 1899-1900 to the record-breaking crop of 16,138,426 bales in the season ended August 31, 1912. The narrow margin between that commercial crop and the amount of cotton consumed by the mills of the world is an indication of an extension of markets for cotton goods of long standing and of an expansion of the uses for cotton, ranging from aseptic dressings to automobile tires. Texas raised last year more cotton than all the mills of the world used as late as 1859. The Southern crop of that year was about one-quarter of the amount of cotton spun by the mills of the world in 1912.

About twenty years ago Edward Atkinson, the eminent statistician of Boston and a prophet of Southern advancement, estimated that for the average of the world's consumption of cotton to equal that of leading nations 42,000,000 bales of cotton would have to be raised every year. At the time of his estimate the world was raising about 12,500,000 bales. Since then the annual production has increased to about half of Atkinson's estimate, but in the meantime the population of the world has become much larger and the opportunities for the use of cotton have become much more diversified.

Textile interests of leading foreign nations have in the past ten years revived the ambitions, manifested in England sixty-odd years ago, to become independent of the South for their supplies of raw material by raising cotton in other lands. Two years ago an association of English spinners invested more than \$3,000,000 in 32,000 acres of Mississippi delta cotton lands and another purchase of 25,000 acres in the same locality for \$2,000,000 by Manchester spinners and others was concluded early in this year. These movements point straight to the advantage that will come to the South in utilizing to the fullest extent its own cotton crop by exporting it in the form of finished products instead of as raw material upon which other peoples shall make the main profit.

Since 1880 more than 55,000,000 tons of cotton has been raised in the South, and of that amount more than 42,000,000 tons, or 65 per cent., has been sent to foreign countries. There was little difference between the proportions exported in 1880 and 1912, although of the aggregate 304,726,865 bales of the thirty-three crops, the

mills of the United States used 104,825,110 bales, and in 1912 used within a few thousand bales of the Southern crop of 1882. In the meantime, however, the textile industry in the South has made notable progress.

In the late forties and early fifties, at a time when Southern cotton mills had begun to make inroads upon the American markets of Northern mills, it was argued in the North that there was comparatively slight encouragement for the industry in the South. Even then the South was making checks, gingham, osnaburgs and other cloths in addition to yarns, quantities of the latter being shipped to other parts of the country. It was natural, after the war, for the manufacture of yarn to have the call in the South for a while. But all that has been changed. In all the South, now embracing sixteen States, there were 687,666 active spindles in 1880, which used 111,777,177 pounds of cotton, the spindles being 6.4 per cent. of the total number of active ones in the United States and using 14.8 per cent. of the cotton used by all the mills in the country. Last year the 11,858,600 active spindles in the South used 1,319,707,813 pounds of cotton, their number being 38.8 per cent. of those in all the mills of the country, and the cotton used being more than half the total quantity consumed. In the thirty-odd years, with a slight increase in the amount of cotton consumed per spindle in the rest of the country, from 64 pounds to 67 pounds, the average amount thus consumed in the South decreased from 163 pounds to 111 pounds per spindle, marking the advance in the South in the spinning of finer yarns toward the position of mills in the rest of the country. Contemporaneously the active loom equipment of Southern mills increased from 14,754, or 6.6 per cent. of the total in the country, to 252,279, or 35.5 per cent. of the total, the number in the South in 1912 being 26,520 greater than the number in the whole country in 1880 and the number of the South's spindles at work being 1,203,165 greater than the country's thirty-three years ago. These equipment statistics suggest not only the multiplicity, but also the multifariousness of the South's textile activities today, producing a hundred different lines of goods, spun, woven and knit. The bulk of cotton goods exported from this country is made in the South.

Prophecies of Southern inability to enter the textile field to any great extent have failed. The South's task is, of its own initiative or in co-operation with capital from other parts of the country, to take advantage of its unsurpassed opportunities, to the end that by the time the world shall be calling for an annual world crop of 42,000,000 bales the South will be raising 30,000,000 of them, and instead of sending 85 per cent. of its crop to other parts of the world for manufacture, will be consuming that much of it at home in making goods for the markets of the world.

### DISPOSITION OF THIRTY-THREE COTTON CROPS.

Year Ended. August 31.	Crop, Bales.	—United States— Consumption.		Average Price Per Lb. N.Y., Middling	
		South, Bales.	North, Bales.	Exports, Uplands, Bales.	Cents.
1880.....	5,761,252	179,000	1,610,978	3,885,003	12.02
1881.....	6,605,750	208,000	1,730,937	4,589,346	11.34
1882.....	5,456,048	236,000	1,728,535	3,582,622	12.16
1883.....	6,949,756	340,000	1,733,096	4,766,597	10.63
1884.....	5,713,200	337,000	1,539,683	3,916,581	10.64
1885.....	5,706,165	298,000	1,455,125	3,947,972	10.54
1886.....	6,575,691	345,000	1,817,544	4,336,263	9.44
1887.....	6,505,087	401,452	1,710,080	4,463,009	10.25
1888.....	7,046,833	456,090	1,804,993	4,685,031	10.27
1889.....	6,938,290	479,781	1,785,979	4,830,463	10.71
1890.....	7,311,322	546,894	1,799,258	5,000,879	11.53
1891.....	8,652,597	604,661	2,027,362	5,856,194	9.03
1892.....	9,035,379	686,080	2,190,766	5,917,249	7.64
1893.....	6,700,365	743,848	1,687,286	4,500,047	8.24
1894.....	7,549,817	718,515	1,601,173	5,336,553	7.67
1895.....	9,901,251	862,838	2,083,839	6,889,577	6.50
1896.....	7,157,346	904,701	1,600,271	4,751,602	8.16
1897.....	8,757,964	1,042,671	1,804,680	6,092,537	7.72
1898.....	11,199,994	1,231,841	2,211,740	7,690,477	6.22
1899.....	11,274,840	1,399,399	2,190,095	7,454,161	6.00
1900.....	9,436,416	1,597,112	2,068,300	6,055,874	8.69
1901.....	10,383,422	1,620,931	1,967,570	6,649,152	8.96
1902.....	10,680,680	1,937,971	2,050,774	6,740,538	8.75
1903.....	10,727,559	2,000,729	1,967,635	6,771,398	10.27
1904.....	10,011,374	1,919,252	2,026,967	6,114,498	12.42
1905.....	13,565,885	2,163,505	2,282,145	8,773,037	9.11
1906.....	11,345,988	2,374,225	2,319,478	6,763,551	11.29
1907.....	13,510,982	2,439,108	2,526,390	8,503,270	11.45
1908.....	11,571,966	2,193,277	1,896,661	7,573,349	11.29
1909.....	13,825,457	2,559,873	2,680,118	8,574,024	10.12
1910.....	10,609,668	2,341,303	1,993,904	6,339,428	14.97
1911.....	12,120,095	2,363,616	1,993,576	7,770,842	14.55
1912.....	16,138,426	2,744,067	2,631,432	10,506,465	10.83

Total... 304,726,865 40,276,740 64,548,370 199,627,529

Note.—The figures of Southern consumption in the first seven years are estimates in part, and in all years cover only cotton-growing States of the South. The figures of exports in the last seven years include linters.

### THE COMMERCIAL COTTON CROP, BY BALES, IN PAST FIVE YEARS.

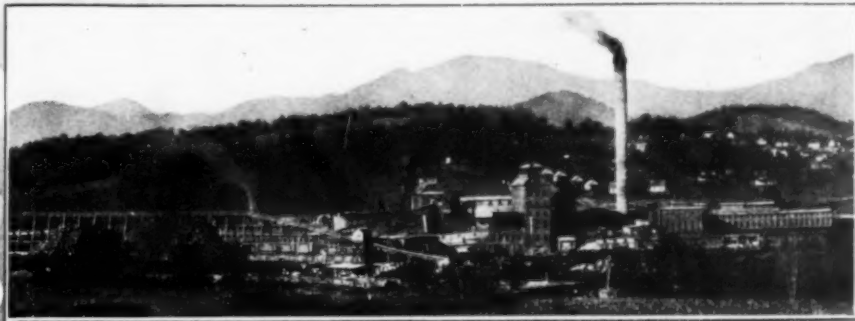
States.	1911-12.	1910-11.	1909-10.	1908-09.	1907-08.
Ala.....	1,738,000	1,209,000	1,078,000	1,428,000	1,171,000
Ark.....	941,000	846,000	718,000	1,052,000	787,000
Fla.....	95,000	68,000	66,000	75,000	60,000
Ga.....	2,878,000	1,853,000	1,927,000	2,118,000	1,964,000
La.....	403,000	273,000	282,000	485,000	673,000
Okla.....	1,036,000	924,000	566,000	704,000	950,000
Miss.....	1,221,000	1,239,000	1,121,000	1,673,000	1,496,000
N. C.*...	1,194,000	794,000	676,000	747,000	689,000
S. C.....	1,732,000	1,231,000	1,184,000	1,298,000	1,226,000
Tenn.†...	573,000	424,000	316,000	426,000	335,000
Tex.....	4,327,000	3,259,000	2,676,000	3,819,000	2,221,000

Total... 16,138,000 12,120,000 10,610,000 13,825,000 11,572,000

\*Including Kentucky and Virginia. †Including Missouri, Arizona, California, Kansas and New Mexico. Cotton has been raised as far north as Illinois, but its domain for commercial production lies south of latitude 37 degrees north. Last year it was grown in 16 States and two Territories.

### TEXTILE ACTIVITIES IN THE SOUTH AND IN THE WHOLE COUNTRY COMPARED BY DECADES.

Year ended Aug. 31.	The South.		United States.	
1880.....	Active spindles.....	687,666	10,653,435	
	Active looms.....	14,754	225,759	
	Cotton used, pounds..	111,777,177	750,343,981	
1890.....	Active spindles.....	1,719,600	14,188,103	
	Active looms.....	39,445	324,866	
	Cotton used, pounds..	279,728,025	1,117,945,776	
1900.....	Active spindles.....	4,467,383	19,050,952	
	Active looms.....	113,106	455,752	
	Cotton used, pounds..	749,915,066	1,817,643,390	
1910.....	Active spindles.....	11,149,465	28,611,000	
	Active looms.....	236,845	682,000	
	Cotton used, pounds..	1,121,960,467	1,838,127,768	
1912.....	Active spindles.....	11,858,600	30,578,828	
	Active looms.....	252,279	710,000	
	Cotton used, pounds..	1,319,707,813	2,587,662,380	



WOOD PULP FOR PAPER

# Diversity of Southern Manufactures



LOCOMOTIVE WORKS



SHOE FACTORY



IN A CIGAR CENTRE



STEEL RAILS & SHIPBUILDING



STOCK YARDS & PACKING HOUSE



COKE OVENS



STEEL RAILS & SHIPBUILDING



LUMBER PLANT



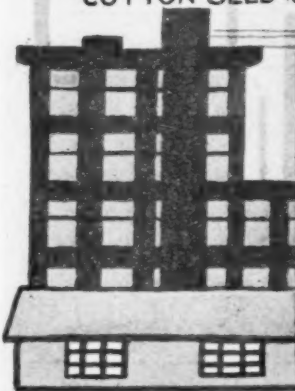
COTTON SEED OIL MILL



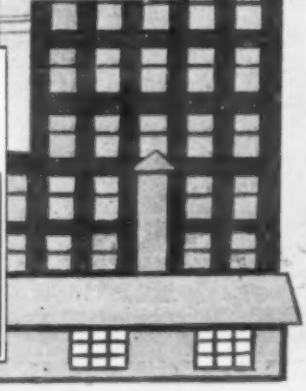
LEATHER



ZINC SMELTER



UP TO DATE COTTON MILL





# Iron and Steel and Textiles



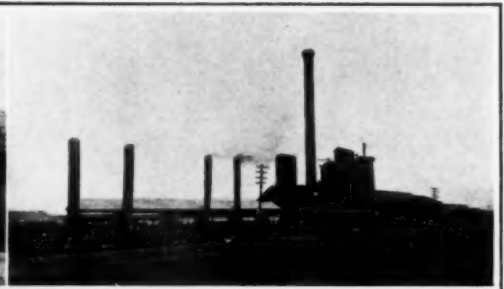
A FOUNDRY AND MACHINE SHOP.



CHARCOAL IRON PLANT.



MINING MACHINERY FACTORY.



A BLAST FURNACE.



IRON PIPE PLANT.



SHEET AND TIN PLATE WORKS.



BOILER FACTORY.



SHIPBUILDING AND DRYDOCK.



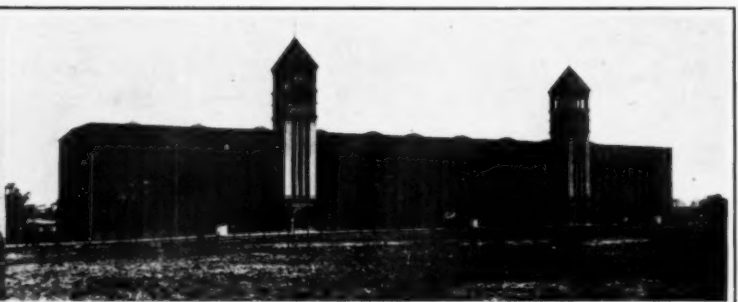
CAR WHEEL WORKS.



IRON WORKS ON THE RIVER.



WHERE FIBERS ARE MANIPULATED.



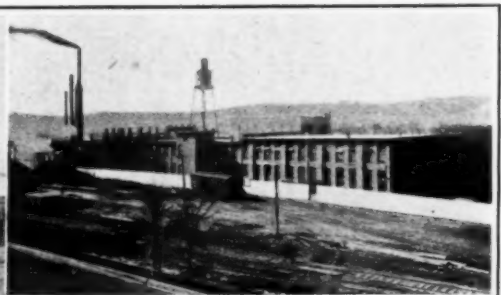
A PIONEER IN MODERN COTTON MILLS.



COTTON BAG FACTORY.



ABSORBENT COTTON PLANT.



HOSIERY MILLS.

# Timber Products and Fertilizers



LUMBER PLANT IN FULL BLAST.



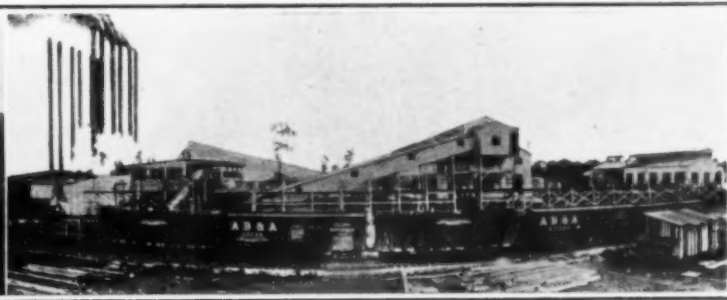
A TURPENTINE ORCHARD.



EXPEDITING LUMBER HANDLING.



CREOSOTING WORKS.



DERIVING NAVAL STORES FROM WOOD WASTE.



PAPER AND PULP PLANT.



WAGON WORKS.



TANNERY IN THE MOUNTAINS.



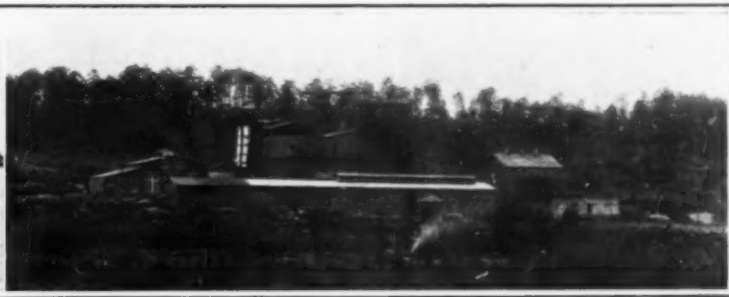
PULP AND PAPER PLANT.



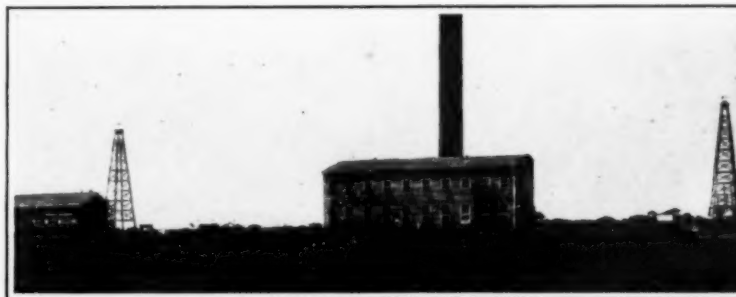
BLOTTING PAPER FACTORY.



OIL AND FERTILIZER FROM FISH.



DERIVING NITRATES FROM THE AIR.



HANDLING ALMOST PURE SULPHUR.



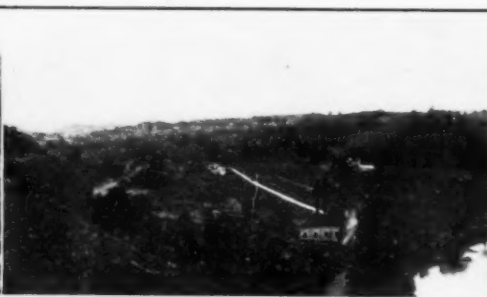
DRYING AND SHIPPING PHOSPHATE.



# Clay Products and Food Stuffs



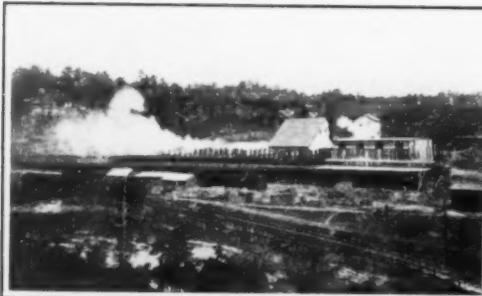
MANUFACTURING CARBON.



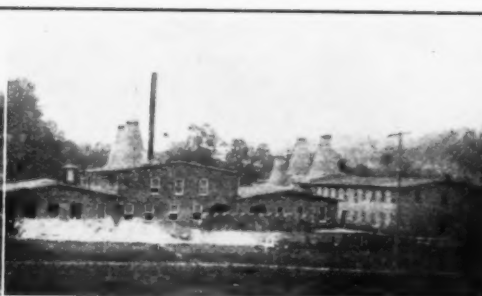
IN A GYPSUM FIELD.



LAMP BLACK FROM NATURAL GAS.



MODERN BRICK KILNS.



POTTERY.



BRICK OVENS.



PLATE-GLASS FACTORY.



FLOUR MILL.



GLASS MAKING.



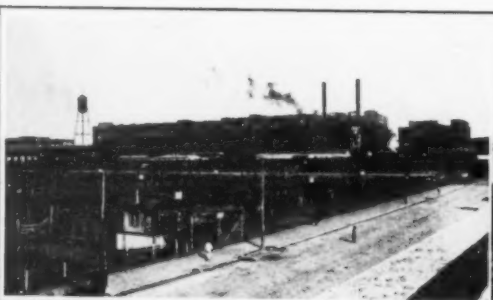
INLAND SUGAR REFINERY.



TRUCK BOXES AND BASKETS.



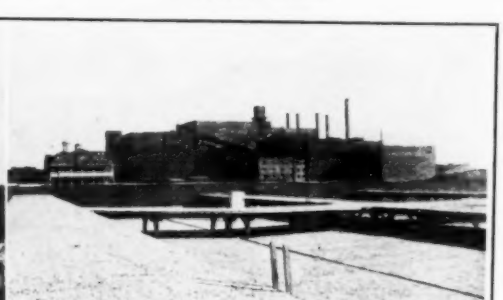
SYRUP MILL.



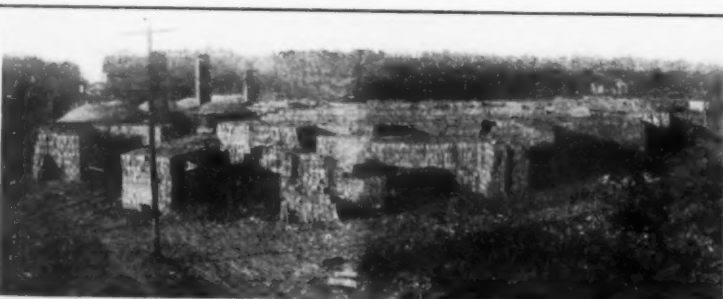
STOCK-YARDS.



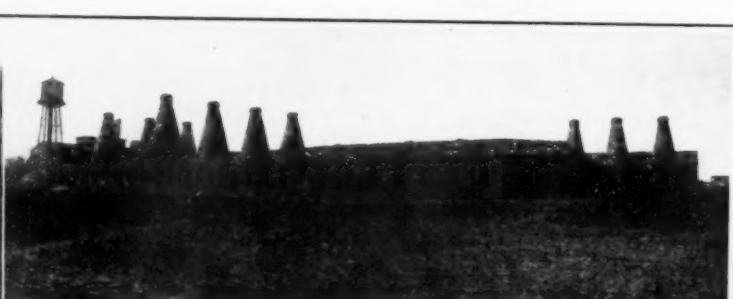
RICE MILL.



ABATTOIR.



BRICK AND ROOFING.



CHINA WARE FACTORY.

# Broad Lines for Future Growth of Southern Manufacturing



Of the 262 distinct lines of manufacturing in the country, 236 are carried on in the South. This indicates that the capabilities of the South as a manufacturer on diversified lines are equal to those of the rest of the country where diversification has made greater advance. Southern capabilities in this respect are manifest in the progress already made. Between 1880 and 1912, figures for the latter year being estimated, with a population in the South increasing from 18,615,000 to 33,475,000, or at the rate of 79.9 per cent., and in the rest of the country from 31,781,000 to 62,473,000, or at the rate of 96.6 per cent., the capital invested in manufacturing increased in the South from \$329,753,000 to \$3,500,000,000, or at the rate of 961.4 per cent., and in the rest of the country from \$2,460,520,000 to \$17,500,000,000, or at the rate of 611.2 per cent.; and the value of products increased in the South from \$622,840,000 to \$3,900,000,000, or at the rate of 526.2 per cent., and in the rest of the country from \$4,746,739,000 to \$19,100,000,000, or at the rate of 302.4 per cent.

In that period the capital invested in manufacturing in the South increased to an amount greater by \$700,000,000 than the capital so invested in the whole country in 1880.

The capital invested in manufacturing of all kinds increased between 1880 and 1890 from \$329,753,000 to \$848,868,000, or at the rate of 157.4 per cent. in the South, and in the rest of the country from \$2,790,273,000 to \$6,525,051,000, or at the rate of 133.5 per cent., and in the next ten years the increase was to \$1,408,866,000, or at the rate of 65.9 per cent. in the South, and in the rest of the country to \$9,831,487,000, or at the rate of 50.6 per cent.

In the value of products of manufacturing there was an increase between 1880 and 1890 from \$622,840,000 to \$1,242,581,000, or at the rate of 99.5 per cent. in the South, and in the whole country from \$5,369,579,000 to \$9,372,379,000, or at the rate of 74.6 per cent., and in the next ten years the increase was to \$1,860,113,000, or at the rate of 49.7 per cent. in the South, and in the United States to \$13,010,037,000, or at the rate of 38.8 per cent. Since 1900 there has been no official compilation of the figures of the capital invested in manufacturing as a whole and of the value of manufactured products. But a basis for a measure of growth is had in the figures for 1900 and 1909 of the capital invested in factories, not including hand-trades and neighborhood industries, and of the value of factory products. Such capital constituted about 91 per cent. of the total manufacturing capital in the country in 1900, and such value about 87 per cent. of the value of manufactured products in that year.

The value in 1909 of the products of all factories in the United States in 262 distinct lines was \$20,672,052,000, an increase of \$9,265,125,000, or 81.2 per cent. over 1900. In the South the value of such products in 236 distinct lines was \$3,158,399,000, an increase of \$1,594,216,000, or 101.9 per cent. Of the total in the South, \$2,696,121,000, or 85.3 per cent., represented the output of 92 lines of manufacturing, of which 13 lines, with an aggregate output of \$37,995,000, cannot, because of the lack of separate figures, be compared with 1900. But the remaining 79 comparable lines of manufacturing increased between 1900 and 1909 in production from \$1,288,203,000 to \$2,658,126,000, or at the rate of 106.3 per cent., 4.4 per cent. greater than the rate of increase in the value of all Southern factory products and 25.1 per cent. greater than the rate of increase in the value of the products of all the factories in the United States.

Revival of manufacturing activities after the war and the paralysis following that struggle turned in large measure upon the primary manipulation of such raw materials as cotton, iron ore and lumber. Between 1880 and 1890 manufacturing in the South reached a productive value greater than that of agriculture, a stage through which the country as a whole had passed between 1850 and 1860. That lead is still maintained, and, notwithstanding the increasing tendency to differentiation, as what were once final products of Southern manufacturing, such as planks and boards, cotton yarns and pig-iron, have come to be the raw materials for other industries adding to the total value of production, so great is the wealth of the natural resources of the

South that some years must pass before the value of the products of first handlings of materials in industry shall be much less proportionately than the value of the results of subsequent handlings, the difference being broadly typed in a comparison of the value of a pound of pig-iron and of that same pound of iron turned into steel watch springs.

It is not surprising, therefore, that the value of lumber and timber, cotton goods, flour and grist, meats, cottonseed oil and meal and tobacco manufactures constitutes 41 per cent. of the total value of all Southern factory products, although the sure tendency is revealed in the fact that in 1900 it was 49 per cent. of the total.

Scanning of details in the table on next page emphasizes the future character of manufacturing in the South. The value of brooms produced in 1909, for instance, was \$248,000. But that sum was an increase of \$238,000, or 2380

per cent. over 1900. Other large rates of increase in that period were turned wood, 800 per cent.; paper goods, 753.9 per cent.; photo-engraving, 500 per cent.; cutlery and tools, 482.5 per cent.; blacking, 400 per cent.; butter, cheese, etc., 361 per cent.; distilled liquors, 326.8 per cent.; boots and shoes, 294.2 per cent.; food preparations, 281.5 per cent.; rice cleaning and polishing, 260.3 per cent.; glass, 259.5 per cent.; electrical machinery and appliances, 256.8 per cent.; cordage and twine, 254.7 per cent.; hosiery and knit goods, 231.1 per cent.; baskets, 224.9 per cent.; copper, tin and sheet iron, 211.3 per cent., and ice, 206.6 per cent.

There was a more than trebling of value in each of these lines within the nine years and a more than doubling in value in twenty-five other lines. Though the increase in the value of lumber and timber products was but 93.9 per cent., there were increases of 129.9 per cent. in the value of furniture made, of 174.1 per cent. in the value of street car shops output, and of 182.3 per cent. in the value of paper and wood pulp, while in 1909 wood preserving had an output valued at \$1,078,000 and wood distillation one of \$138,000. Cottonseed-oil mills produced to the value of \$130,762,000, or more than half of the value of the output of cotton mills. The latter increased between 1909 at the rate of 136.9 per cent., but the rate of increase for hosiery and knit goods was 231.1 per cent. Even greater divergence appears in the rates of increase of 97.3 per cent. for tanned leather and 294.2 per cent. for boots and shoes. The figures for iron and steel works and for blast furnaces are not complete, as they do not cover the operations of some individual plants of importance, especially in Maryland and Alabama,

and the same thing is true of shipbuilding and boatbuilding, but diversification in iron and steel is shown in the increases in the nine years in the value of products of foundries and machine shops of 138.8 per cent.; of wire-working plants, 182.1 per cent.; in electrical machinery and supplies, of 256.8 per cent., and in cutlery and tools, of 482.5 per cent.

In 1909 Missouri led the States of the South in the number of distinct lines of industry, 195; with Maryland second, 170; Kentucky third, 133; Virginia fourth, 130; Georgia fifth, 122; Texas sixth, 120; Tennessee seventh, 118; Louisiana eighth, 106; West Virginia ninth, 90; Alabama tenth, 88; North Carolina eleventh, 84; Oklahoma twelfth, 73; Arkansas thirteenth, 72; South Carolina fourteenth, 69; Florida fifteenth, 56, and Mississippi sixteenth, 49.

About one-twelfth of the lines of industry were common to all of the States, but some were confined to two or three States, or even one, such as the manufacture of lamp black, of glass, of straw hats, of artificial stone and of cigar boxes, handling peanuts for markets and wood-turning. The 92 industries treated separately in the table do not include copper smelting in Maryland, Missouri, Tennessee, Texas and Virginia; lead smelting in Missouri and Texas; zinc smelting in Missouri, Oklahoma, Virginia and West Virginia; bar pipe and sheet lead in Maryland, Missouri and South Carolina; petroleum refining in Kentucky, Louisiana, Maryland, Missouri, Texas, West Virginia and Oklahoma; saw-making in Alabama, Georgia, Maryland, Mississippi, Missouri and Tennessee; axle grease in Kentucky, Louisiana, Missouri and Tennessee; babbitt metal and solder in Maryland, Missouri, Tennessee and

## SOUTHERN MANUFACTURING EPITOMIZED.

### CAPITAL INVESTED.

	The South.	United States.
1880*	\$329,753,000	\$2,790,273,000
1890*	\$848,868,000	\$6,525,051,000
1900*	\$1,408,866,000	\$9,831,487,000
1909†	\$2,883,929,000	\$18,428,270,000

### VALUE OF PRODUCTS.

	The South.	United States.
1880*	\$622,840,000	\$5,369,579,000
1890*	\$1,242,581,000	\$9,372,379,000
1900*	\$1,860,113,000	\$13,010,037,000
1909†	\$3,158,399,000	\$20,672,052,000

### INCREASES.

#### CAPITAL INVESTED.

	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890*	\$519,115,000	157.4	\$3,734,778,000	133.5
1890-1900*	\$559,998,000	65.9	\$3,306,436,000	50.6
1900-1909†	\$1,687,627,000	141.	\$9,453,014,000	105.3

#### VALUE OF PRODUCTS.

	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890*	\$619,741,000	99.5	\$4,002,800,000	74.6
1890-1900*	\$617,532,000	49.7	\$3,637,658,000	38.8
1900-1909†	\$1,594,216,000	101.9	\$9,265,125,000	81.2

\*Including hand-trades and neighborhood industries.

†Factories only, not including hand-trades and neighborhood industries.



Virginia; paper bags in Maryland, Missouri and Virginia; bicycles and motorcycles in Missouri and North Carolina; cement in Alabama, Georgia, Kentucky, Maryland, Missouri, Oklahoma, Tennessee, Texas, Virginia and West Virginia; charcoal in Alabama, Arkansas, Georgia, Maryland, Missouri, Tennessee and Texas; textile dyeing in Alabama, Kentucky, Maryland, Missouri, North Carolina, South Carolina and West Virginia; foundry supplies in Alabama, Kentucky, Missouri and Virginia; hair work in Arkansas, Kentucky, Maryland, Missouri and Texas; bolts, rivets, etc., in Alabama, Georgia, Kentucky, Maryland and Missouri; iron and steel forging in Alabama, Louisiana, Maryland, Missouri and Virginia; hones and whetstones in Arkansas; paving materials in Georgia, Maryland, South Carolina, Tennessee and the District of Columbia; dye stuffs and extracts in Florida, Georgia, North Carolina, South Carolina, Tennessee, Virginia and West Virginia; cloth sponging in Kentucky and Maryland; dressed flax and hemp in Kentucky; malt in Kentucky, Maryland and Oklahoma; wire in Kentucky and Virginia; sugar and molasses in Louisiana, Maryland and Texas; sulphuric, nitric and mixed acids in Louisiana, Maryland, Tennessee and Virginia; mats and matting in Maryland; starch and oakum in Maryland; files in Texas; locomotives (not made by railroad companies) in Virginia and Georgia; tin plate andterne plate, grindstones, wrought iron pipe and steel pipe in West Virginia; essential oils in Virginia; lead pencils in Georgia, and others, their total number being 144, and the aggregate value of their products, \$462,278,000. Some of them represent an investment of millions of dollars, but others are still upon a relatively small scale. But every one of them is a sample of what the South can do in manufacturing, and not a single one of them has yet attained the proportions justified by the opportunities.

The very youthfulness and, consequently, the fullness of the promise of many of the manufacturing enterprises of the South are strikingly manifested in a juxtaposition of the figures of the growth of population in the ten years between 1900 and 1910 and of the growth of factories. The total population of the South increased from 27,445,457 to 32,480,343, or at the rate of 18.3 per cent., while the capital invested in factories increased at the rate of 141 per cent. and the value of their products at the rate of 101.9 per cent. The population of cities having 10,000 inhabitants or more increased from 4,253,668 to 5,781,702, or at the rate of 35.9 per cent., and the population of the rest of the South from 23,191,789 to 26,698,641, or at the rate of 15.1 per cent. In 1900 52.9 per cent. of the factory capital of the South was invested in cities of 10,000 inhabitants or more, and the value of their products was 51.9 per cent. of the total. In 1909, eliminating the figures for cities not comparable with those of 1900, the factory investment in the cities was 41 per cent. of the total and the value of factory products 45.2 per cent. of the total. In the nine years the value of factory capital in these cities increased at the rate of 86.9 per cent. and the value of their products at the rate of 75.8 per cent., while the factory capital in the rest of the South increased at the rate of 109.2 per cent. and the value of factory

## Increase in Leading Southern Factory Productions.

Industries.	Value of Products.		Increase.	
	1900.	1909.	Amount.	Per ct.
Lumber and Timber.....	\$233,940,000	\$453,585,000	\$219,645,000	93.9
Cotton Goods.....	99,118,000	234,891,000	135,773,000	136.9
Flour and Grist Mills.....	109,330,000	209,146,000	99,816,000	91.3
Slaughtering and Meat Packing	63,966,000	156,072,000	92,106,000	143.9
Cottonseed Oil and Meal.....	51,585,000	130,762,000	79,177,000	153.4
Tobacco Manufactures.....	67,524,000	113,422,000	45,898,000	70.
Printing and Publishing.....	50,285,000	101,820,000	51,535,000	102.8
Foundries and Machine Shops.	40,667,000	97,153,000	56,486,000	138.8
Steam Railroad Car Shops....	51,397,000	92,384,000	40,987,000	79.7
Men's Clothing.....	43,045,000	72,790,000	29,745,000	69.1
Fertilizers.....	23,173,000	65,524,000	42,351,000	182.7
Sugar Refining.....	46,748,000	63,775,000	17,027,000	36.4
Boots and Shoes.....	15,500,000	61,345,000	45,785,000	294.2
Bakery Products.....	23,473,000	59,416,000	35,943,000	153.1
Malt Liquors.....	30,834,000	57,066,000	26,232,000	85.1
Distilled Liquors.....	12,692,000	54,163,000	41,471,000	326.8
Copper, Tin and Sheet Iron...	12,767,000	39,753,000	26,986,000	211.3
Leather, Tanned, etc.....	19,748,000	38,974,000	19,226,000	97.3
Iron and Steel Works.....	21,600,000	35,227,000	13,627,000	63.1
Carriages and Wagons.....	20,267,000	32,610,000	12,343,000	60.9
Furniture.....	13,727,000	31,557,000	17,830,000	129.9
Blast Furnaces.....	24,686,000	31,278,000	6,592,000	26.7
Confectionery.....	11,810,000	25,161,000	13,351,000	113.1
Turpentine and Rosin.....	20,345,000	25,078,000	4,733,000	23.2
Leather Goods.....	14,018,000	24,963,000	10,945,000	78.1
Patent Medicines, Drugs, etc..	12,951,000	24,530,000	11,579,000	89.4
Canning and Preserving.....	19,874,000	22,915,000	3,041,000	15.3
Rice Cleaning and Polishing..	5,736,000	20,671,000	14,935,000	260.3
Brick and Tile.....	11,186,000	20,437,000	9,251,000	82.7
Ice.....	6,549,000	20,077,000	13,528,000	206.6
Coke.....	9,093,000	19,408,000	10,315,000	113.4
Marble and Stone.....	7,602,000	17,452,000	9,850,000	130.9
Gas.....	8,367,000	17,138,000	8,771,000	104.8
Hosiery and Knit Goods.....	5,053,000	16,831,000	11,778,000	231.1
Cooperage and Wooden Goods.	8,269,000	14,404,000	6,135,000	74.2
Coffee and Spice Roasting....	5,266,000	12,062,000	6,796,000	129.1
Glass.....	3,196,000	11,492,000	8,296,000	259.5
Stoves and Furnaces.....	*	11,351,000	.....	.....
Paper and Wood Pulp.....	3,968,000	11,203,000	7,235,000	182.3
Pottery, Terra-Cotta, etc.....	5,209,000	11,073,000	5,864,000	112.5
Women's Clothing.....	5,942,000	10,562,000	4,620,000	77.7
Food Preparations.....	2,782,000	10,613,000	7,831,000	281.5
Paint and Varnish.....	5,907,000	10,533,000	4,626,000	78.3
Peanut, Grading, etc.....	*	7,933,000	.....	.....
Woolen, Worsted, Felt, etc....	4,180,000	6,849,000	2,669,000	63.8
Mattresses and Spring Beds...	2,281,000	5,985,000	3,704,000	162.4
Butter, Cheese, etc.....	1,236,000	5,698,000	4,462,000	361.
Bags, not of paper.....	3,443,000	5,352,000	1,909,000	55.4
Ship and Boat Building.....	4,834,000	5,237,000	403,000	8.3
Chemicals.....	3,075,000	4,953,000	1,878,000	61.
Soap.....	*	4,719,000	.....	.....
Lime.....	*	4,090,000	.....	.....
Fancy and Paper Boxes.....	1,670,000	4,040,000	2,370,000	140.7
Agricultural Implements.....	2,597,000	3,880,000	1,283,000	49.4
Wire Work.....	1,204,000	3,396,000	2,192,000	182.1
Straw Hats.....	*	3,347,000	.....	.....
Electrical Machinery, etc.....	911,000	3,251,000	2,340,000	256.8
Coffins, etc.....	1,583,000	3,233,000	1,650,000	104.2
Brass and Bronze.....	1,639,000	2,969,000	1,330,000	81.1
Cordage and Twine.....	733,000	2,600,000	1,867,000	254.7
Millinery.....	754,000	2,238,000	1,484,000	196.8
Musical Instruments.....	1,054,000	2,054,000	1,000,000	94.8
Awnings, Tents, Sails.....	985,000	1,784,000	799,000	81.1
Automobiles.....	*	1,677,000	.....	.....
Umbrellas and Canes.....	1,098,000	1,650,000	552,000	50.3
Street Car Shops.....	540,000	1,480,000	940,000	174.1
Photographic Supplies.....	1,022,000	1,415,000	393,000	38.4
Belting and Hose, Rubber....	*	1,318,000	.....	.....
Jewelry.....	544,000	1,130,000	586,000	107.7
Wood Preserving.....	*	1,078,000	.....	.....
Paper Goods.....	108,000	922,000	814,000	753.9
Brooms and Brushes.....	607,000	849,000	242,000	39.8
Baking Powders, etc.....	345,000	840,000	495,000	143.4
Artificial Stone.....	*	754,000	.....	.....
Cigar Boxes.....	243,000	698,000	455,000	187.2
Hats, not Wool, Straw or Felt.	239,000	648,000	409,000	171.1
Gas and Electric Fixtures, etc.	337,000	642,000	305,000	90.5
Turned Wood.....	68,000	612,000	544,000	800.
Cutlery and Tools.....	103,000	600,000	497,000	482.5
Blacking, etc.....	120,000	600,000	480,000	400.
Lamp Black, etc.....	*	596,000	.....	.....
Silk Goods, etc.....	*	512,000	.....	.....
Mirrors.....	*	482,000	.....	.....
Baskets.....	145,000	471,000	326,000	224.9
Photo-engraving.....	75,000	450,000	375,000	500.
Belting and Hose, Leather....	224,000	445,000	221,000	98.6
Showcases.....	223,000	433,000	210,000	94.1
Salt.....	257,000	407,000	150,000	58.4
Tobacco Pipes.....	261,000	396,000	135,000	51.7
Silver and Plated Ware.....	200,000	355,000	155,000	77.5
Brooms.....	10,000	248,000	238,000	2380.
Wood Distillation.....	*	138,000	.....	.....
Total.....	\$1,288,203,000	\$2,696,121,000	\$1,369,923,000	106.3
All others.....	\$275,980,000	\$462,278,000	\$186,298,000	67.5
All Southern Factory Products.	\$1,564,184,000	\$3,158,399,000	\$1,594,216,000	101.9
United States Factory Products.	\$11,406,927,000	\$20,672,052,000	\$9,265,125,000	81.2

NOTE.—These figures deal only with the products of factories having an output of more than \$500 annually. They do not include hand trades and neighborhood industries. The asterisk indicates that comparable figures are not accessible. In some of the items, such as shipbuilding, iron and steel works, brooms and brushes, etc., the figures are not complete, the Census Bureau not giving them in detail, to avoid revealing the operations of individual industries.

products at the rate of 120.9 per cent. For one city having a population greater than 25,000 in 1910, and for twenty-four cities having a population between 10,000 and 25,000, in that year the figures of factories in 1900 are not accessible, and that fact must be borne in mind in noting that in the first group the rates of increase were 84.7 per cent. in capital and 72.7 per cent. in value of products, and in the second group, including only the comparable cities, the rates were 104.9 per cent. in capital and 102.2 per cent. in value of products.

The greater rates of increase in capital and in value of products in the communities not included in the two groups of cities, as well as the fact that in the two groups less than half of the manufacturing industry of the South is carried on, point to the many ramifications of industry, and they are forecasts of conditions of the next few years continuing on a larger scale those of the recent past in which much of the increase in urban population has been due to the rise of factories.

In 1880 there were but sixteen cities in the South having each a population greater than 25,000, and of them only five had more than 100,000 inhabitants. By 1910 thirty-two other cities had increased their population to more than 25,000, and there were eleven cities having more than 100,000 inhabitants, ranging from St. Louis with 687,029 to Nashville with 110,364. In 1900 only eighty cities in the South had a population greater than 10,000, but that number was increased to 118 in 1910. One of these cities was not on the map in 1900, and the rates of increase in others ranged from 1208 per cent. at Tulsa, Okla., to 539.7 per cent. at Oklahoma City; 494.2 per cent. at Muskogee, Okla.; 300.7 per cent. at Enid; 260.3 per cent. at Shawnee; 221.6 per cent. at Chickasha, and 214 per cent. at McAlester, reflecting the sudden growth in a new State; 245.4 per cent. at Birmingham, Ala.; 181 per cent. at Hattiesburg, Miss.; 174.7 per cent. at Fort Worth, Tex.; 173.2 per cent. at Durham, N. C.; 170.7 per cent. at Jackson, Miss.; 161.4 per cent. at Huntington, W. Va.; 146.9 per cent. at El Paso, Tex.; 146.6 per cent. at Gadsden, Ala.; 144.7 per cent. at Waycross, Ga.; 140.9 per cent. at Bluefield, W. Va.; 138.5 per cent. at Tampa, Fla.; 118.9 per cent. at Beaumont, Tex.; 116 per cent. at Dallas, Tex.; 107.2 per cent. at Charleston, W. Va.; 107.1 per cent. at Fort Smith, Ark., and 103 per cent. at Jacksonville, Fla. Some of these cities were not large enough to be considered separately in the 1900 census of manufacturers, but others paralleled their increases in population with increases in the capital invested in factories, the rates of increase ranging from 847.5 per cent. at Oklahoma City for factory capital to 191.8 per cent. at Alexandria, Va., whose population increased only 5.5 per cent. In the case of the former, a city practically of the twentieth century and of the latter dating back into the eighteenth century, the close connection between growth in industrial activities and increase in population is clearly shown. The truth is revealed more or less forcibly in the cases of many other Southern cities.

Where manufacturing is of longer standing and has led to an expansion of other material activities, the percentage of increase in factories is not as large as in localities where one large industry has been established within the past decade or where many

smaller industries dependent for material upon the output of local plants have developed.

It is to be expected that the diversification, already apparent in the comparison of factory products in 1900 and 1909, will assume greater and greater proportions; but, in the meantime, that there will be even larger additions on lines in which only a beginning has been made, or which have not yet been attempted. There is, for instance, a wonderful opportunity in the South for canning and preserving, which increased the value of its products only 15.3 per cent. between 1900 and 1909; for furniture-making, agricultural implements, paper and other products originating in the forests; for industries handling iron and steel and other metals; for a greater variety of finished cotton goods; for clay products of various kinds and for chemicals. The visit last year of sixty German, Austrian and Belgian chemical technologists to

is annually wasted in the use of coal, and that, while the country is each year producing about 3,000,000 tons of sulphuric acid, the basis of all chemical industry, of which about one-half goes into manufactured fertilizers, sulphur dioxide in quantity sufficient to make more than 8,000,000 tons of sulphuric acid is discharged into the air. Compelled by law to do away with the nuisance of the fumes from their copper smelters, the East Tennessee companies installed plants to utilize these wastes in the manufacture of sulphuric acid, and not only abated the nuisance, but added to their revenues. The day of the beehive coke oven is passing in the South, and as that section contains about 75 per cent. of the coal suitable for coking, the increase in recovery ovens is bound to accelerate greatly the growth of industries using the valuable by-products.

If the occasion is promptly seized, the opening of the Panama Canal within

### TEN YEARS' INCREASE IN MANUFACTURING AND IN POPULATION.

(In cities having more than 25,000 inhabitants in 1910).

	Population.		Increase Per Cent. 1900-10.	Capital in Factories.			Products of Factories.		
	1900.	1910.		Amount.	1900.	Increase Per Cent.	Value.	1909.	Increase Per Cent.
Atlanta, Ga.	89,872	154,839	72.3	\$14,603,000	\$30,878,000	111.4	\$14,419,000	\$33,038,000	129.1
Augusta, Ga.	39,441	41,040	4.1	7,987,000	11,066,000	38.5	7,984,000	10,456,000	30.9
Austin, Tex.	22,258	29,860	34.2	595,000	2,340,000	293.3	765,000	2,846,000	272.0
Baltimore, Md.	508,957	558,485	9.7	107,217,000	164,437,000	53.4	135,108,000	186,978,000	38.3
Birmingham, Ala.	38,415	132,685	245.4	4,314,000	23,718,000	449.8	8,599,000	24,128,000	180.6
Charleston, S. C.	55,807	58,833	5.4	5,398,000	6,573,000	21.8	5,713,000	6,951,000	21.6
Charlotte, N. C.	18,091	34,014	88.0	3,803,000	9,451,000	148.5	4,187,000	10,460,000	149.8
Chattanooga, Tenn.	30,154	44,004	47.9	7,459,000	16,125,000	116.1	10,518,000	16,036,000	52.4
Columbia, S. C.	21,108	26,319	24.7	3,879,000	7,705,000	98.9	3,134,000	5,872,000	87.3
Covington, Ky.	42,938	53,270	24.1	4,228,000	6,634,000	56.9	5,479,000	8,712,000	59.0
Dallas, Tex.	42,638	92,104	116.0	6,462,000	17,688,000	173.7	9,488,000	26,959,000	184.1
El Paso, Tex.	15,906	39,279	146.9	793,000	4,252,000	436.2	1,213,000	3,638,000	199.9
Fort Worth, Tex.	26,688	73,312	174.7	2,153,000	7,443,000	245.7	3,488,000	8,661,000	148.3
Galveston, Tex.	37,789	36,981	2.1	4,688,000	4,572,000	2.5	3,675,000	6,308,000	71.6
Houston, Tex.	44,633	78,800	76.6	5,627,000	16,594,000	194.9	7,492,000	23,016,000	207.2
Huntington, W. Va.	11,923	31,161	161.4	2,198,000	4,917,000	123.7	3,643,000	6,511,000	78.7
Jacksonville, Fla.	28,429	57,699	103.0	1,858,000	7,068,000	280.4	1,799,000	6,722,000	273.6
Joplin, Mo.	26,023	32,073	23.2	1,268,000	2,992,000	135.9	2,325,000	4,136,000	77.8
Kansas City, Mo.	163,752	248,381	51.7	22,992,000	42,729,000	85.8	23,589,000	54,705,000	131.9
Knoxville, Tenn.	32,637	36,346	11.4	5,036,000	5,333,000	5.9	6,202,000	8,149,000	31.4
Lexington, Ky.	26,369	35,099	33.1	1,366,000	1,896,000	38.8	1,889,000	2,851,000	50.9
Little Rock, Ark.	38,307	45,941	19.9	2,928,000	6,045,000	106.4	3,379,000	6,882,000	103.3
Louisville, Ky.	204,731	223,928	9.4	44,016,000	79,437,000	80.5	66,110,000	101,284,000	53.2
Lynchburg, Va.	18,891	29,494	56.1	2,300,000	9,217,000	300.7	2,994,000	10,188,000	240.3
Macon, Ga.	23,272	40,665	74.7	4,009,000	8,476,000	111.4	5,452,000	10,763,000	96.3
Memphis, Tenn.	102,320	131,105	28.1	9,767,000	26,968,000	176.1	14,233,000	30,242,000	112.4
Mobile, Ala.	38,469	51,521	33.9	2,506,000	5,250,000	109.4	3,486,000	5,429,000	55.7
Montgomery, Ala.	30,346	38,136	25.7	2,020,000	5,234,000	159.1	2,944,000	5,442,000	84.8
Muskogee, Okla.	4,254	25,278	491.2	*	969,000	...	*	2,279,000	...
Nashville, Tenn.	80,865	110,364	36.5	11,874,000	27,880,000	134.8	15,301,000	29,650,000	93.7
New Orleans, La.	287,104	339,075	18.1	42,858,000	56,934,000	32.8	57,446,000	78,794,000	37.1
Newport, Ky.	28,301	30,309	7.1	2,389,000	4,568,000	91.2	3,548,000	6,491,000	82.9
Norfolk, Va.	46,624	67,452	44.7	4,419,000	10,744,000	143.1	4,692,000	10,341,000	120.4
Oklahoma City, Okla.	10,037	64,205	539.7	473,000	4,482,000	847.5	845,000	7,868,000	831.1
Portsmouth, Va.	17,427	33,190	90.5	815,000	1,233,000	51.3	900,000	1,528,000	59.1
Richmond, Va.	85,050	127,628	50.1	16,890,000	31,660,000	87.4	24,670,000	47,358,000	91.9
Roanoke, Va.	21,495	34,874	62.2	1,916,000	4,828,000	151.9	5,398,000	7,261,000	34.5
St. Joseph, Mo.	102,979	77,403	24.8	8,016,000	12,038,000	50.1	11,362,000	17,626,000	55.1
St. Louis, Mo.	575,238	687,029	19.4	150,526,000	269,392,000	78.9	193,733,000	328,495,000	69.5
San Antonio, Tex.	53,321	96,614	81.2	3,929,000	8,629,000	119.6	5,989,000	13,435,000	124.3
Savannah, Ga.	54,244	65,064	19.9	3,755,000	9,334,000	148.5	3,750,000	6,734,000	79.5
Shreveport, La.	16,013	28,015	75.0	1,229,000	3,719,000	202.6	1,556,000	3,643,000	134.1
Springfield, Mo.	23,267	35,201	51.3	1,930,000	5,517,000	185.8	3,434,000	5,382,000	56.6
Tampa, Fla.	15,839	37,782	138.5	3,821,000	11,610,000	293.0	7,083,000	17,653,000	149.2
Waco, Tex.	20,686	26,425	27.7	1,768,000	3,561,000	101.4	2,294,000	4,769,000	107.9
Washington, D. C.	278,718	331,069	18.8	17,960,000	30,553,000	70.1	16,426,000	25,289,000	53.9
Wheeling, W. Va.	38,878	41,641	7.1	12,275,000	19,297,000	57.2	15,074,000	27,077,000	79.6
Wilmington, N. C.	20,976	25,748	22.7	1,758,000	2,022,000	16.1	2,283,000	3,005,000	31.6
Total	3,564,180	4,740,340	33.1	\$570,071,000	\$1,054,008,000	84.7	\$735,151,000	\$1,271,981,000	72.7

\*No figures available. †Decrease. ‡As of April 15.

localities in the South illustrating its abundant supplies of water-power for electricity, of sulphur, salt, natural gas, oil and other mineral wealth, was calculated to give an impetus to the utilization of such materials in the application of chemistry to industry, not only in the older chemical manufacturing centers, but also in the South itself with the creation of new industries there or the enlargement of existing ones, which are in one State already deriving nitrates from the air by the electric chemical process, converting yellow pine refuse into paper in another State, and deriving ethyl alcohol and other valuable products from wood in a third.

Chemistry is to play a big part, too, in the South in the prevention of enormous wastes. A recent study by Charles L. Parsons for the national bureau of mines showed that, if retort ovens were exclusively used in the manufacture of coke, they would yield from carbon now wastefully consumed approximately 1,000,000 horse-power a year, and add, in the value of by-products, about \$40,000,000 to the output of industry; that \$160,000,000 worth of nitrogen

a few months should result in attracting millions of dollars of capital to the South for investment in manufacturing at points accessible to the Canal. The Ishmian waterway is an invitation to the manufacturers of the United States to recover neglected advantages for commerce with the Latin American republics. The surest means of doing that is to establish new industries convenient to the sources of raw material in the South and to the shortest routes to the northern entrance to the Canal. Southern seaports, as well as Southern interior cities having special advantages for manufacturing, should witness an enormous increase of industrial activities through the investment of Eastern, Western and foreign capital attracted by the possibilities opened by the Canal.

Discovery of the vast deposits of iron ore in the Mesabi region twenty-odd years ago resulted in a movement of the center of iron manufacturing from tidewater toward the interior of the country, and checked temporarily the remarkable progress made in the industry in the South between 1880 and 1890.



But, with the establishment of plants at or near tidewater using Cuban or other foreign ores, and with approach to the time when the Birmingham district will have direct water connection with the Gulf, the tendency in the industry is again toward tidewater, and that should mean the development of other industries there. Moreover, active interests in seaboard cities are beginning to be more and more impressed with the fact that mere foreign commerce, that is, the passing to and fro of merchandise at the ports, is not the sole element to be considered in working for improvement of conditions in their respective cities. Through a shifting of the centers of production upon which the export trade

has largely depended, and through the construction of north and south lines of railroads in the Mississippi and in the southeastern section of the country, there have been brought about marked changes in the standing of a number of Southern ports. A few, once leaders in foreign commerce, have failed to maintain their rank, and others, the creation of a few years, are now flourishing and full of promise of greater importance. The natural advantages in location and in accessibility from the ocean have not waned in the slightest degree. They may be availed of profitably, if the manufacturing instincts in the ports are cultivated as they should be.

### INCREASE IN MANUFACTURING AND IN POPULATION.

(In cities having between 10,000 and 25,000 inhabitants in 1910).

	Population.		Increase Per Cent.	Capital in Factories.			Products of Factories.		
	1900.	1910.		Amount.	1900.	1910.	Amount.	1900.	1910.
Alexandria, La. ....	5,648	11,213	98.5	*	\$1,638,000	....	*	\$1,279,000	....
Alexandria, Va. ....	14,528	15,329	5.5	\$1,606,000	4,687,000	191.8	\$1,539,000	4,420,000	187.2
Anniston, Ala. ....	9,695	12,794	31.9	1,774,000	4,345,000	144.9	1,863,000	4,333,000	132.4
Argenta, Ark. ....	†	11,138	....	*	2,240,000	....	*	4,842,000	....
Asheville, N. C. ....	14,694	18,762	27.7	1,174,000	2,827,000	140.9	1,301,000	3,250,000	149.8
Athens, Ga. ....	10,245	14,913	45.5	671,000	1,921,000	186.3	678,000	2,112,000	211.5
Baton Rouge, La. ....	11,269	14,897	32.2	747,000	909,000	21.7	717,000	658,000	†8.9
Beaumont, Tex. ....	9,427	20,640	118.9	2,010,000	4,007,000	99.3	1,913,000	4,831,000	153.0
Bessemer, Ala. ....	6,358	10,864	70.9	*	7,812,000	....	*	6,106,000	....
Bluefield, W. Va. ....	4,644	11,188	140.9	*	948,000	....	*	1,465,000	....
Brownsville, Tex. ....	6,305	10,517	66.8	*	51,000	....	*	121,000	....
Brunswick, Ga. ....	9,081	10,182	12.1	270,000	452,000	67.4	703,000	672,000	†4.6
Charleston, W. Va. ....	11,069	22,096	107.2	1,054,000	2,825,000	168.0	1,262,000	3,235,000	156.5
Chickasha, Okla. ....	3,209	10,320	221.6	*	1,117,000	....	*	1,867,000	....
Cleburne, Tex. ....	7,493	10,364	38.3	*	773,000	....	*	1,577,000	....
Columbus, Ga. ....	17,614	20,554	16.7	4,710,000	7,997,000	69.8	5,061,000	8,552,000	68.9
Cumberland, Md. ....	17,128	21,839	27.2	2,352,000	4,095,000	74.1	2,900,000	4,534,000	56.3
Danville, Va. ....	16,520	19,020	15.1	4,324,000	6,059,000	40.1	3,694,000	5,389,000	45.9
Denison, Tex. ....	11,807	13,632	15.5	1,108,000	1,108,000	....	840,000	1,314,000	56.3
Durham, N. C. ....	6,679	18,241	173.2	*	15,389,000	....	*	23,272,000	....
Enid, Okla. ....	3,444	13,799	300.7	*	1,097,000	....	*	2,453,000	....
Fort Smith, Ark. ....	11,587	23,975	107.1	897,000	3,206,000	257.4	1,401,000	3,739,000	166.9
Frankfort, Ky. ....	9,487	10,465	10.3	1,035,000	2,403,000	132.1	1,327,000	3,083,000	132.3
Frederick, Md. ....	9,296	10,411	11.9	1,033,000	2,370,000	129.4	1,438,000	2,911,000	102.3
Gadsden, Ala. ....	4,282	10,557	146.6	*	987,000	....	*	1,525,000	....
Greensboro, N. C. ....	10,035	15,895	58.4	885,000	1,696,000	91.6	925,000	2,032,000	119.6
Greenville, S. C. ....	11,860	15,741	32.7	1,081,000	1,930,000	78.5	966,000	2,142,000	121.7
Guthrie, Okla. ....	10,006	11,654	16.4	371,000	1,092,000	194.3	649,000	1,443,000	122.3
Hagerstown, Md. ....	13,591	16,507	21.5	1,121,000	2,970,000	164.9	1,820,000	3,197,000	73.6
Hannibal, Mo. ....	12,780	18,341	43.5	1,754,000	2,498,000	42.4	2,699,000	6,195,000	129.5
Hattiesburg, Miss. ....	4,175	11,733	181.0	*	1,341,000	....	*	1,251,000	....
Henderson, Ky. ....	10,272	11,452	11.5	653,000	2,257,000	245.6	1,032,000	2,932,000	184.1
Hot Springs, Ark. ....	9,973	14,434	44.7	149,000	770,000	416.8	191,000	845,000	342.4
Jackson, Miss. ....	7,816	21,262	170.7	*	1,783,000	....	*	3,113,000	....
Jackson, Tenn. ....	14,511	15,779	8.8	980,000	2,236,000	128.1	1,577,000	2,710,000	71.8
Jefferson City, Mo. ....	9,664	11,850	22.6	1,489,000	3,079,000	106.8	3,061,000	5,446,000	77.9
Key West, Fla. ....	17,114	19,945	16.5	1,738,000	1,911,000	9.9	3,088,000	3,965,000	28.4
Lake Charles, La. ....	6,680	11,449	70.1	*	1,619,000	....	*	2,251,000	....
Laredo, Tex. ....	13,429	14,855	10.6	203,000	213,000	4.9	331,000	221,000	†30.0
Marshall, Tex. ....	7,855	11,452	45.8	*	1,690,000	....	*	1,787,000	....
Martinsburg, W. Va. ....	7,564	10,698	41.4	*	2,100,000	....	*	2,515,000	....
McAlester, Okla. ....	4,125	12,954	214.0	*	619,000	....	*	451,000	....
Meridian, Miss. ....	14,050	23,285	65.7	1,402,000	3,816,000	172.3	1,924,000	4,238,000	120.2
Moberly, Mo. ....	8,012	10,923	36.3	459,000	1,320,000	187.5	792,000	1,984,000	150.6
Monroe, La. ....	5,428	10,209	87.1	*	1,082,000	....	*	1,255,000	....
Natchez, Miss. ....	12,210	11,791	†3.4	1,243,000	931,000	†25.1	1,115,000	1,114,000	....
Owensboro, Ky. ....	13,189	16,011	21.4	1,960,000	4,294,000	119.1	1,740,000	3,505,000	104.4
Paducah, Ky. ....	19,446	22,760	17.0	2,559,000	4,703,000	83.8	2,977,000	4,967,000	66.8
Palestine, Tex. ....	8,297	10,482	26.3	560,000	1,524,000	172.1	704,000	1,313,000	86.5
Paris, Ky. ....	9,358	11,269	20.4	570,000	1,381,000	142.3	743,000	1,430,000	92.5
Parkersburg, W. Va. ....	11,703	17,842	69.5	2,358,000	4,424,000	87.6	3,101,000	5,498,000	77.3
Pensacola, Fla. ....	17,747	22,982	29.5	1,158,000	2,164,000	86.9	1,053,000	1,963,000	86.4
Petersburg, Va. ....	21,810	24,127	10.6	3,175,000	5,221,000	64.4	5,294,000	8,896,000	68.0
Pine Bluff, Ark. ....	11,496	15,102	31.4	1,644,000	2,585,000	57.2	1,541,000	2,387,000	54.9
Raleigh, N. C. ....	13,643	19,218	40.8	728,000	2,027,000	178.4	947,000	2,376,000	150.9
Rome, Ga. ....	7,291	12,099	65.9	*	1,551,000	....	*	1,864,000	....
San Angelo, Tex. ....	....	10,321	....	*	306,000	....	*	318,000	....
Sedalia, Mo. ....	15,231	17,822	17.0	1,152,000	2,346,000	103.6	1,283,000	2,333,000	81.8
Selma, Ala. ....	8,713	13,649	56.6	573,000	1,722,000	200.5	1,419,000	2,382,000	67.8
Shawnee, Okla. ....	3,462	12,474	260.3	*	1,532,000	....	*	2,081,000	....
Sherman, Tex. ....	10,243	12,412	21.1	748,000	1,638,000	118.9	1,461,000	4,676,000	220.0
Spartanburg, S. C. ....	11,395	17,517	53.7	2,335,000	4,471,000	91.5	1,591,000	3,276,000	105.8
Staunton, Va. ....	7,289	10,604	45.5	*	715,000	....	*	1,223,000	....
Temple, Tex. ....	7,065	10,993	55.6	*	916,000	....	*	1,346,000	....
Tulsa, Okla. ....	1,390	18,182	1,208.0	*	1,153,000	....	*	1,563,000	....
Tyler, Tex. ....	8,069	10,400	28.8	321,000	661,000	105.9	682,000	996,000	46.0
Vicksburg, Miss. ....	14,834	20,814	40.3	1,145,000	1,236,000	7.9	1,368,000	2,229,000	62.9
Waycross, Ga. ....	5,919	14,485	144.7	*	868,000	....	*	1,203,000	....
Webb City, Mo. ....	9,201	11,817	28.4	181,000	462,000	155.2	354,000	777,000	119.5
Winston, N. C. ....	10,008	17,167	71.5	3,969,000	12,856,000	223.9	4,888,000	16,778,000	243.2
Total .....	689,488	1,041,368	47.9	\$63,429,000	\$178,972,000	104.9	\$77,953,000	\$224,007,000	102.2

\*No figures available. †Decrease. ‡As of April 15. §Argenta was included in Little Rock in 1900. The percentages of aggregate increase are for the aggregate of comparable cities.

# Cotton Seed Potentialities

By DR. ANDREW M. SOULE, President Georgia State College of Agriculture.

"And lo!  
To the remotest point of sight,  
Although I gaze upon no waste of snow,  
The endless field is white;  
And the whole landscape glows,  
For many a shining league away.  
With such accumulated light  
As Polar lands would flash beneath a tropic day!"  
—Henry Timrod.



**W**HAT can it be? A fuzzy, unpretentious-looking little seed, yet it contains within its heart limitless potentialities. It has been a useful servant to man for untold centuries, the cultivation and use of the fiber for the manufacture of cloth having been practiced in India many centuries before the advent of the Christian era. When Columbus discovered America, he found cotton growing abundantly in the West Indies. Cortez found cotton in Mexico in 1519, and he used the seed to stuff the jackets of his soldiers, so they might turn aside the arrows of the native archers. Cotton was the chief article of clothing among the Mexicans and constituted some of the most highly prized presents from Cortez to Charles V. of Spain. Pizarro discovered cotton in Peru in 1522 and the Peruvian mummies buried many years, possibly centuries, before that date were frequently wrapped in cotton blankets. Magellan saw cotton among the Brazilians. Hence, this marvelous plant was evidently indigenous to at least two continents.

The introduction of cotton into the United States is shrouded in obscurity, but enough is known to establish the fact that the seed was brought from a great variety of sources by the early pioneers. There is documentary evidence indicating that cotton would reproduce itself successfully in Virginia as early as 1609, and a pamphlet entitled "A Declaration of the State of Virginia," published in 1620, mentions cotton as among the colonies' most promising crops. No doubt cotton was introduced into Florida by the Spaniards, but the date is not definitely known. It is quite certain that Oglethorpe planted something like 50 seeds in the vicinity of Savannah in 1733. It is supposed that Sea Island cotton was successfully introduced into the United States about 1785 from the West Indies, while the origin of our upland cottons is thought to be traceable to some of the ancient varieties so successfully cultivated for centuries past in Mexico. Just how the seed was introduced and disseminated throughout the great cotton belt of the United States will always remain more or less of a mystery.

The preceding statements are interesting because they demonstrate the humble beginnings of the principal industry of the South and illustrate some of the difficulties which the pioneers overcame in their endeavors to introduce and acclimatize the cotton plant, and show the slow progress made, relatively speaking, in the development of an industry which has now become world-renowned.

## BEGINNINGS OF THE COTTON OIL INDUSTRY.

Cotton was first cultivated for its fiber, and many centuries elapsed after its known use for this purpose before any attempt was made to utilize the seed. History indicates that the people of India crushed the seed in some sort of crude press many centuries ago. The oil was apparently first used for illuminating purposes. In the United States there are references to the fact that the oil was used in lamps as a substitute for whale oil as early as 1750, and evidently this practice was quite common about 1820. Apparently, this was the first use made of oil obtained from cotton seed in America, which is rather surprising because the oil expressed from the sebaceous seed of various cultivated plants has been esteemed from the earliest times as one of the most valuable and desirable gifts of nature.

About 1783 the city of London records the fact that seed from the West Indies was crushed in a mill and oil extracted. The result was so satisfactory that prizes were offered for the encouragement of the industry. According to Mills, Benjamin Waring, of Columbia, S. C., erected a mill and expressed a very good oil from cotton seed at a date previous to 1826. In 1832, a small oil mill was operated in one of the islands off the coast of Georgia, and attempts to extract the oil were made at Natchez, Miss., about 1834. The manufacture of oil was undertaken in New Orleans about 1847 and a Mr. Good, who undertook the work, exhibited a small bottle of the oil which he is reported to have sold cost him \$12,000. This fact is quoted to show the present generation the tremendous odds with which the early pioneers in this industry had to contend. An oil mill was established in New Orleans about 1855, and in 1860 there were several establishments for the manufacture of cottonseed oil in the United States. The war interrupted the development of this industry so that in 1867 there were only four mills in the South, but from that date forward the development of this industry has been simply marvelous, and the despised and neglected seed, allowed to accumulate around the gin-house or thrown into the creek or river so that the freshet might carry them away, has now become the corner-stone and, indeed, the very foundation of one of the principal commercial and manufacturing industries of the South.

## PRESENT PROPORTIONS OF THE COTTONSEED INDUSTRY.

In 1911, there were 841 oil mills engaged in the business of crushing cotton seed in the 12 Southern States. The seed produced in that year may be conservatively estimated at 6,997,000 tons. Of this amount 4,921,073 tons, or 70 per cent. of the crop, were taken by the mills. The average price reported for the seed for 1911 by the Federal Census Bureau was \$18.30 per ton. Thus, the cottonseed-oil industry paid out to the Southern farmers \$131,340,000 for

raw material. From this material were manufactured not less than 200,000,000 gallons of oil, 2,151,000 tons of cake and meal, 1,642,000 tons of hulls and 533,098 bales of linters. Assuming that the refined by-products obtained from a ton of seed become worth \$30 as a result of passing through the mill, the effort of the manufacturer has made this crude material worth \$150,000,000 to the South. Assuming that the value of the by-products obtained from a ton of seed becomes worth \$35 as a result of passing through the mill, the output of the oil mills of the South would approximate \$173,000,000 annually. To the layman this may look like a large profit, but it must be borne in mind that the oil mills in the South employ at present between 25,000 and 30,000 people and thus give direct sustenance, on the basis of five persons per family, to between 125,000 and 150,000 people. Moreover, the cost of manufacturing and deductions for waste, bad seed and low-grade oil must all be taken into consideration, and finally, the average manufacturer who could not at least double through manufacturing processes the price paid for his raw material would not be able to remain in business.

These figures have been presented in this connection, not with the idea of showing great profits on the part of the oil mill owners, but to illustrate their potential power in increasing the wealth of the South and in adding to the value of what is fast coming to be regarded as one of our chief sources of raw material.

The statistics quoted show that more than 2,000,000 tons of seed were retained on the Southern farms last year. Allowing one bushel to plant each of the 36,000,000 acres of land devoted to cotton in 1911, there would still be left for disposition through the oil mill 1,500,000 tons of seed which were not so utilized. The retention of this seed on the farm still constitutes a great economic loss to the Southern farmer in spite of the wonderful progress which has been made in the development of the oil-mill industry, and it is quite evident that if this seed were crushed that the value of this industry to the South would easily become \$250,000,000. The sale of the seed in question, even at the relatively low price of \$18.30 per ton, would have added to the value of the farmers' earnings \$27,450,000, or nearly 75 cents per acre. Thirty years ago this industry was in its infancy, there being 45 mills in existence in 1880, the value of the output of which was represented by \$7,690,000. Thus, in a period of 30 years the crushing of seed has resulted in increasing the value of the cotton crop by nearly one-quarter of the entire value of the lint in 1911. In view of the rapid increase in the cost of living and the higher appreciation and more general utilization of oil and meal along approved economic lines, and considering the growing disposition of the farmer to dispose of his seed to the mill, it does not take a prophetic mind to appreciate that in the course of a few years this industry will increase in value to the South by not less than \$100,000,000 per annum, and will soon represent a third of the entire value of the cotton crop.

It surely is a wise policy for the farmer to dispose of his seed as completely as possible. The fertilizing value of a ton of seed, allowing a fair valuation for the available nitrogen, phosphorus and potash contained therein, amounts to about \$10.75. The exchange basis of seed for meal allowed by the mills is often quite favorable to the farmer, yet a ton of meal carrying 6.18 per cent. of nitrogen will contain fertilizer worth about \$24.28. The farmer who exchanges his seed for meal not only secures a foodstuff containing fertilizing ingredients of great value, as shown by these figures, but if he feeds the meal to most classes of live stock an additional value is thereby secured. As matters now stand, it appears that the oil industry of the South has made the seed, which was a waste product 30 years ago, worth at least \$3.75 per acre to the Southern farmer. It has already been shown that this value may easily be increased to \$4.50 per acre with seed at a relatively low price. It is certainly not assuming too much to predict that the seed alone will be worth \$5 per acre to the farmer in the very near future.

## INFLUENCE OF THE OIL INDUSTRY ON AGRICULTURE.

The development of the cottonseed-oil industry has given a new impulse to agriculture in that it has furnished by-products which have enabled the inception and development of live stock industries of great importance, and has provided a basis for the manufacture of fertilizer so essential in maintaining the yields of our cotton lands. The fact that it has supplied sources of food for live stock heretofore unavailable has enabled the Southern farmer to diversify his practice and to inaugurate systems of rotation on a more extensive basis than ever before.

As a source of organic nitrogen, cottonseed meal has proven very satisfactory indeed, and naturally it is used as the basis of much of the fertilizer now manufactured throughout the South. While it is better to utilize it in this way than to import materials from other sections for this purpose, it is a fact greatly to be regretted that all the meal produced is not fed to live stock, for if this were done its potential value would be at least doubled and still the home market could easily consume all of it. Unfortunately, a considerable percentage of the meal is still exported to other countries, such as Denmark, Germany and Great Britain. In these foreign lands they have developed a live stock and dairy business of international importance, basing it primarily on the utilization of a by-product of the cotton seed which we do not seem yet to appreciate at its face value at home. It has now been shown, for instance, that two pounds of cottonseed meal added to the average ration of corn and stover fed to horses and mules throughout the South will improve it materially, not only lessening the cost of maintenance, but providing the protein which this class of animals need for their proper nourishment, and which insures their remaining in health and vigor for a longer period of time.



than where fed on a ration of corn and fodder alone as at present. Moreover, the utilization of cottonseed meal for this purpose at home enhances the value of both the seed and the by-products, and tends to stop the drain of fertility from our lands which has gone on at a rapidly increasing ratio ever since the day the virtues of our cotton seed became noised abroad.

#### INFLUENCE ON ANIMAL INDUSTRIES.

Other sections of the country have long since realized the virtues of cottonseed meal as an amendment to the ration of horses. At the Iowa Experiment Station, for instance, it was found that corn and cottonseed meal proved more efficient than a ration of corn and oats. The saving effected by the use of the former ration was 1.6 cents per day, or \$5.84 per year. They found also that cottonseed meal gave better results than linseed meal, and that when corn was valued at 50 cents a bushel and oats at 40 cents, cottonseed meal was worth over \$60 per ton as an amendment to the ration of horses. At the Pennsylvania Experiment Station a ration consisting of corn, cottonseed meal, corn silage and mixed hay was found to be the most economical for the finishing of draft horses. Where this ration was used the cost of a pound of gain was 13.9 cents; where corn, oats and mixed hay were used the cost of a pound of gain was 17.77 cents. The average price of cottonseed meal in 1911 was not far from \$25 per ton. Assuming that the exports in that year were the same as in 1910, there were available for use in the United States 1,470,000 tons of meal, every ton of which if fed under a rational system of management might be made worth for nutritive and fertilizing purposes not less than \$50. It is generally admitted that the greater part of the meal is now used for fertilizer, and it is quite evident that on a conservative basis our farmers are failing to secure for the South an additional potential power which it might confer totaling not less than \$36,750,000 a year.

Cottonseed meal provides the finest concentrate available for the nourishment of dairy cows. It may be used singly or in combination with other feeds. It provides cheaper protein, an essential element in the ration of the dairy cow, than can be secured in any other form. When combined with Bermuda grass pastures for summer grazing and cereal pastures for winter maintenance, it gives the Southern farmer an advantage in the production of milk and butter unsurpassed by any other section of the United States. This concentrate combines admirably with the winter oats grown so successfully in the South or the corn raised in the West, and enhances the feeding value of both. It enriches the yard manure obtained from all classes of live stock more than any other by-product which can be fed, and thus places within the reach of the farmer the power to improve the fertility of his lands through supplying the present deficiency in vegetable matter by the conservation and more liberal use of farmyard manure.

Beef cattle may be fattened successfully on cottonseed meal, hulls, silage, corn stover and other forms of roughness which may be abundantly raised on every Southern farm. The cattle tick has been a menace to the development of the live stock industry on a basis commensurate with the needs of the South; but now that so many Southern States have combined with the Federal Government in an effort to eradicate this pest, the industry of beef ranching and feeding is developing with surprising rapidity in the Southeastern States. While our live stock business may still be regarded as an infant industry in comparison with the ultimate development which may be anticipated through the proper utilization of the meal as a complementary and companion food-stuff, very rapid progress is being made along these lines, and the near future will witness a development in this direction as has not been considered possible until very recently.

#### INFLUENCE ON COMMERCE.

Cotton seed has exerted an important influence on our internal commerce and the export business of the United States. The value of the meal, oil and lard substitutes now shipped abroad amounts to between \$30,000,000 and \$40,000,000 per annum, depending on seasonal conditions and the price received for the raw materials. This large sum of money comes back to the United States in the form of gold, and therefore constitutes a most important national asset. The building of 841 oil mills has of necessity called for the investment of a very large amount of capital. The sum so invested must now approximate \$150,000,000, and this does not include the money invested in refineries, soap factories, lard substitute manufacturing plants or the many subsidiary mills the business of which is directly correlated with the oil industry. The transportation of the seed from the farm to the crushing plant and the distribution of the resulting products has done much to stimulate the freight business on the railroads which traverse the South.

The importance of the oil industry as affecting commerce is well illustrated by the fact that it would have taken 40,000 cars of a capacity of 5000 gallons each to carry the oil produced in 1911. If 20 tons of cake were put in each car, 107,550 cars would have been required for its transportation, and it would have taken 82,100 cars to handle the hulls, allowing 20 tons per car. As cottonseed meal provides the base of much of the fertilizer used in the South, this industry in itself represents a turnover value of more than \$100,000,000 and the transportation of between 5,000,000 and 6,000,000 tons of fertilizer. The powerful influence on the development of our transportation agencies which cotton seed and its by-products exert may be better grasped through the presentation of these figures.

Around every mill organized there has developed a settlement of greater or less proportions, and the industry has added materially to the bank clearings and has brought ready money into every community in which the crushing of seed is pursued. The great increase in value which the mills have given to the seed has enhanced the value of farm lands and the wealth of the planter, and has given him a power for the attainment of luxuries which he formerly did not possess. Increase in taxable values resultant upon progress along this line has made it possible for the towns and cities, and the rural

districts as well, to improve their roads and schools and social organizations. The cotton seed once despised has therefore come to be an important factor in enabling the South to obtain and hold that commercial dominance to which the products of its soil and climate entitle it.

#### INFLUENCE OF OIL ON STANDARDS OF LIVING.

Last, but not least, must be considered the marvelous influence which the discovery and manufacture in large quantities of cottonseed oil has exerted on the human dietary and standards of living throughout the world. For a long time olive oil held supremacy for dietary purposes. Cottonseed oil originally had an acid bitter taste in its crude state which was difficult to overcome, and this rendered it unpalatable and, as many of the friends of the olive industry hoped and believed, unfit for human food. The chemist working in association with the capitalist behind this industry soon discovered methods of extracting the oil which were vastly superior to those employed in the earlier history of the business, and it has been easily possible in recent years to so deodorize and clarify the oil that it has now a sweet and delicious flavor and a brilliancy of color unsurpassed even by olive oil. The fact that the olive crop was cut short a few years ago gave a great impetus to the use of cottonseed oil, for it was exported largely to Europe that season, and there is reason to believe largely used as a substitute for olive oil. This misfortune to one industry was a boon to the other, for it established beyond question the virtues of the oil and demonstrated that it could be blended with olive oil to the best advantage, and in some instances substituted for it altogether. It may now be confidently stated that it would require the services of the keenest expert to detect the difference between olive and cottonseed oil, and no doubt much of the so-called olive oil now sold and consumed by the would-be epicure originated from cotton seed. The virtues of the oil produced from this seed having been so clearly established and its wholesome origin as a vegetable by-product recognized, why not use it on its merits? This is being done more and more successfully from day to day, and a larger number of refineries are yearly devoting their attention to the manufacture of the highest possible grade of cottonseed oil.

There is a market at home for more oil than can possibly be produced in the United States, and owing to the rapid increase in the cost of living, the oil comes as one of the most desirable additions to the dietary, not only being wholesome, but well adapted for many purposes for which the by-products secured through the slaughter-house are not so well suited. It provides a desirable basis for the manufacture of oleomargarine, which, under proper sanitary and Government regulations, affords a wholesome substitute for butter at a lower cost. It may be combined to the greatest advantage in the manufacture of what has been aptly termed "hogless lard," and it may be used directly for all culinary purposes, as the making of salad dressings, bread and cakes, and the cooking of meats and vegetables. There is no reason why cottonseed oil properly made and refined is not as valuable in every respect as olive oil, and it should command the same relative price. The fact that it is growing so rapidly in public favor is one of the happiest signs of the times, and it is destined presently to constitute one of the most popular and important human food products.

#### RESUME.

The sleight-of-hand of the magician excites the imagination of youth. The happiest hours of childhood are frequently those in which the mythical prowess of giants, the achievement of fairies and the marvelous transformations which wizards' wands may bring about are believed possible. But it has been well said that "truth is stranger than fiction," and there probably never lived a man whose intellect would have enabled him to prognosticate the future from the vantage point of 30 years ago and anticipate correctly the marvelous transformations which have been brought about through the manufacture of cotton seed and the general utilization of the by-products. It is a long vision from the days of the pioneers on the shores of Virginia and the coasts of Georgia and Florida to the present time. It is not likely that these hardy pilgrims in a new land anticipated that the planting of a little fuzzy seed, with which they were indifferently acquainted, was to provide the basic industry for millions of people and give their descendants that balance of trade which has made possible the development of one of the greatest nations in the world.

The student of economics finds that from a waste product the raw material has assumed in 30 years a value of \$175,000,000; has given profitable investment to large capital and remunerative employment to thousands of men; has developed the internal commerce of the country; stimulated agricultural production; developed the fertilizer and live stock business; increased the value of the country's exports, and exerted a material influence on human dietetics. Yet it has been shown in this article that we are just beginning to appreciate the potentialities of cotton seed, for at least another \$150,000,000 may be derived from it without increasing the tonnage now produced. Unique in all respects, this seed stands out as one of the most valuable assets of the South. Its virtues have been but feebly enumerated and its possibilities only suggested. In spite of the marvelous development which has been witnessed as the result of using the latent power of the cotton seed with some degree of skill and intelligence, its future power of service to the South can only be surmised, but it is safe to conclude that there is as much constructive energy hidden away in its bosom as when our forefathers first undertook to subdue a wilderness through its cultivation and establish thereby a permanent type of civilization in America.

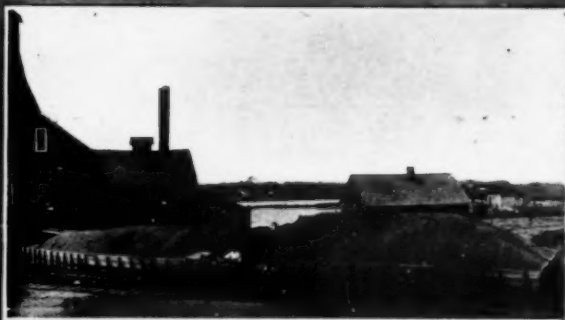
SULPHUR



# Southern Mineral Industries



SALT MINE



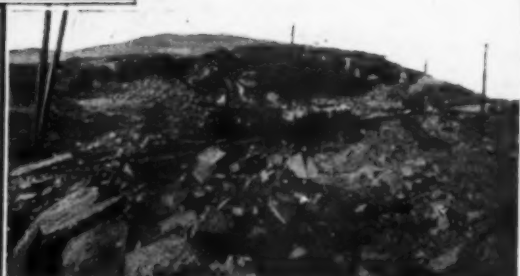
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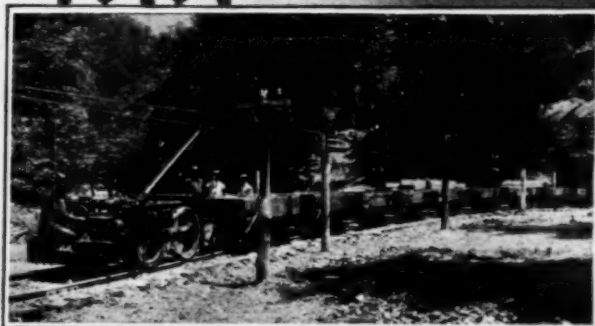
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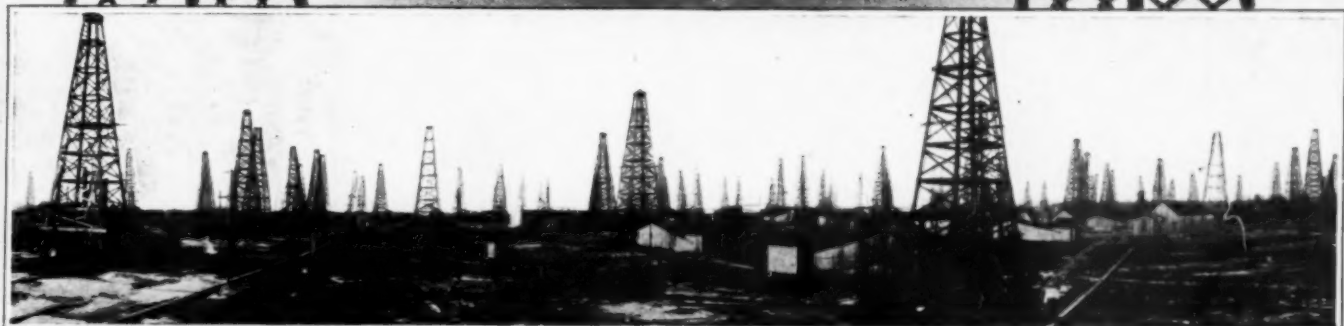
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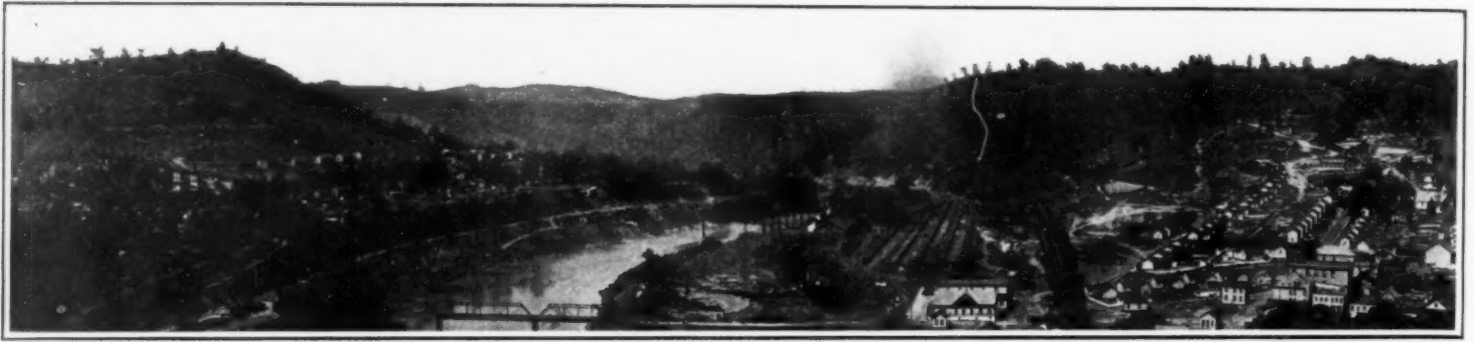
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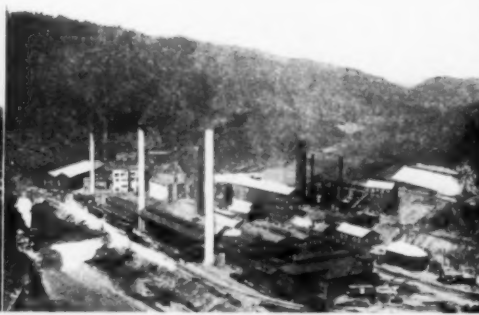
# Bases of Wealth in Mines and Quarries



A COAL MINING COMMUNITY.



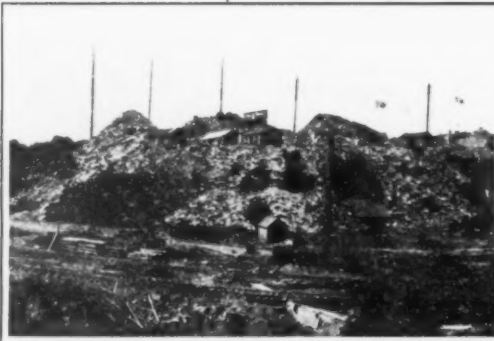
SEWER PIPES FROM CLAY.



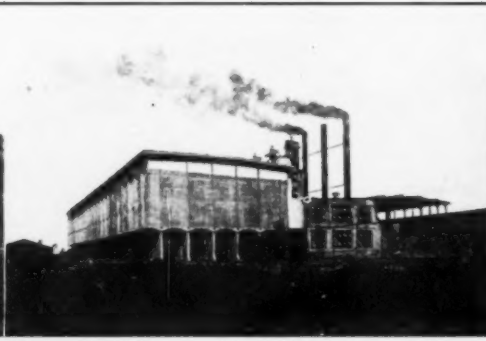
ALKALI WORKS NEAR SALT WELLS.



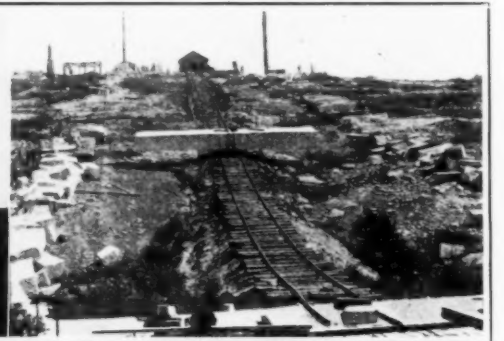
ENTRANCE TO IRON MINE.



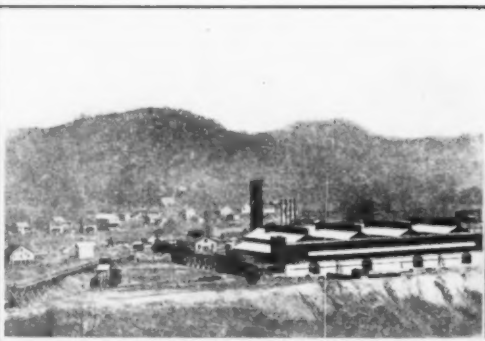
GETTING OUT SLATE.



PHOSPHATE WORKS.



HANDLING GRANITE BLOCKS.



CHEMICAL WORKS IN THE HIGHLANDS.



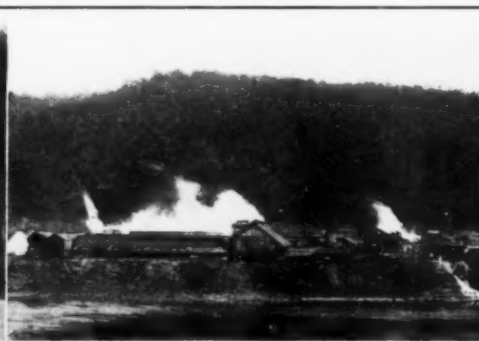
SMELTING COPPER ORE.



MAKING PORTLAND CEMENT.



WORKING MICA.



EVAPORATING SALT.



FELDSPAR MINES.



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# The Mineral Assets of the South

By DR. DAVID T. DAY of the United States Geological Survey.



Considering the value of the South's useful minerals as a national asset, the problem is not so greatly a question of how much is being produced of coal, oil, iron, etc., each year, or even how much has been produced in all during the South's development from the pioneer stage to that of an independent section of the Union capable of supplying practically every material want of the nation. It is true that the amount of useful minerals produced last year was very great. It was one-fifth of the value of the nation's mineral products, notwithstanding the great product of precious metals, copper, lead, etc., in the Western States. Again the total value of the mineral product of the South, added up for all the years, is very great. Of course the prosperity of the South has been dependent upon this addition to its wealth. Nevertheless, a far more vital consideration is the question of how much mineral wealth remains stored up in the Southern States and how much will become valuable, as industries progress, that is not worth mining under present conditions. These considerations hold true for the mineral products, even if sold just as they are mined, and, as has been far too greatly the case, exported to other parts of the Union, or, still more unfortunately, to other nations.

But the most important point of view of our Southern mineral resources is their necessity as essential factors in all other industries. Every industry in the South is dependent upon mineral products, either native or imported. Usually several mineral products are required for each industry; this in spite of the use of wood as fuel in many localities. There is no manufacturing industry which does not depend chiefly on coal, or some other mineral fuel, such as oil or gas. Cheapness of fuel is one of the greatest considerations in the manufacture of any commodity at prices that permit of competition in the open market. The cost of transportation of coal to manufacturing centers is in general greater than the cost of the fuel at the mines. Therefore, a locality is indeed fortunate where the reverse is the case. A home supply of fuel is the greatest general mineral, and in this respect it will be seen later that the South is most fortunate, and that in the very regions where fuel is not so cheap water-power furnishes equivalent supplies of energy.

In most industries there is some other necessary mineral requisite besides mineral fuel. For instance, practically no farming is done in the South without the use of mineral fertilizers, a resource which the South possesses in abundance, sufficient not only for domestic use, but for all the rest of the nation. Indeed, almost as much is exported to Europe. For cotton the use of minerals begins with fertilizing the soil. The oil from the seed requires fuller's earth for refining it. This refining also requires soda, made from salt (of which the South's store is exceptional in quantity and quality), the by-product chlorine obtained in making caustic soda requires another mineral product, lime, with which the chlorine is combined to make bleaching powder used for whitening the cotton cloth. Chrome iron ore, lead ores, coal tar products, from the making of coal gas, are next demanded in dyeing the cotton cloth for the market. This takes account merely of materials actually expended in the making up of cotton products, and not of cotton ties, cotton machinery and the host of steel products which are used over again. Similarly, manganese, borax and other driers are necessary in preparing linseed oil from flaxseed. It is the same with corn oil obtained in the manufacture of starch and glucose. Sugar cane, besides the fuel necessary for grinding, requires lime in refining the juice, and at present strontium ores are sought in this country for use in the refining of beet molasses, according to a method which is popular abroad.

Considering the contributions of the several States to the mineral total, we see from the following table the preponderance of West Virginia development:

Value of Mineral Products in 1911.

West Virginia.....	\$105,958,493	27.4% of South
Missouri .....	53,591,612	13.8% of South
Oklahoma .....	42,678,446	11.1% of South
Alabama .....	40,508,343	10.7% of South
Tennessee .....	20,709,756	5.6% of South
Kentucky .....	19,703,061	5.3% of South
Texas .....	18,817,304	5.1% of South
Virginia .....	16,361,461	4.6% of South
Maryland .....	12,840,892	3.7% of South
Louisiana .....	12,710,958	3.6% of South
Florida .....	10,250,228	3.0% of South
Georgia .....	5,907,723	1.8% of South
Arkansas .....	5,829,606	1.8% of South
North Carolina.....	2,648,786	1.0% of South
South Carolina.....	1,804,115	.8% of South
Mississippi .....	1,052,092	.7% of South
Total .....	\$371,372,876	19.7% of U. S.

Over one-fourth of the South's products come from the single State of West Virginia. This State bears the same relation to the other Southern States that Pennsylvania does to the nation, and for the same reason—coal in great quantities for use at home and a surplus for export. This supremacy of coal applies to quality as well as quantity, and offers the greatest inducement to the development of manufactures. In this, West Virginia is ably supported by the widespread occurrence of natural gas.

## THE PRESENT MINERAL INDUSTRIES OF THE SOUTH.

Of the 57 useful minerals mined in the United States, every one is produced in the South except borax and platinum, and to make up for those not produced, nine, namely, phosphate, rock, tin, bauxite, manganese, sulphur, monozite, zircon, barite, fuller's earth, nearly all the mica, and pyrite were produced no where outside of the South. The total value of the minerals of which the South produced, none was comparatively slight, only \$14,317,325, while the products obtained in the South alone aggregated \$371,372,876 in value in 1911. This was the balance of trade in the South's favor, and as a general rule the South produced more of each commodity than was required for home consumption in its crude state. It is in regard to finished products from its own raw materials that the South suffers the folly of exporting the South's raw materials only to re-import them in finished forms. The manufacturing industries which come between these raw materials and the finished products have meanwhile supported thousands of skilled laborers in other regions. Every plan of advancement for the South must include the simple thought, "Home industry."

Considering that more than a million tons of West Virginia coal goes annually to supply fuel for transatlantic steamers, the coal resources of West Virginia must surely be considered one of the nation's greatest assets. But a greater position still awaits the State when this great product is all consumed at home, and thus effects the utilization of great stores of other now useless mineral resources.

West Virginia not only ranks first in coal production in the South, but second in quantity and third in value of coal production among all the States of the nation. Twelve other mineral products are also produced there, and yet others exist, but are not utilized. Eighty per cent. of the mineral production of West Virginia is made up of the three fuels—coal, petroleum and natural gas.

From a product in West Virginia of \$105,958,493, or 27.4 per cent. of the South's mineral output, the value falls to less than half, or \$53,591,612 in Missouri, the State second in rank. Here lead and zinc are the chief products, but cheap fuel, chiefly from the mines of Southern sections, and adequate transportation facilities have led to greater development of the minor resources, such as clay products and building stones.

Oil in Oklahoma has already brought that new State up to third place among the Southern States, but the products which should follow the production of such cheap fuels as oil and natural gas are still only produced to a slight extent.

Alabama almost equals Oklahoma on account of its iron products, and here we find advantage taken of the close association of coal, iron ores and limestones in developing not only raw pig iron, but without allowing this pig iron to cool it is transferred to other furnaces to reappear as implements of steel. Near by in this enterprising iron district the coking ovens are arranged with mechanical charging and discharging apparatus, and the volatile products are utilized. The gases are burned under the boilers, the ammonia is saved and the coal tar is shipped to other centers for treatment.

In Tennessee, besides the iron ores and phosphate rock, the marble produced is counted one of the nation's assets because of its good quantity and the low price at which it is sold all over the Union.

Kentucky ranks even with Tennessee in the total value of its mineral products because of the large coal and oil product. The State's valuable limestones include lithographic stone of good enough quality to replace the material now obtained solely from Solenhäufen, in Germany, at any time when that source of supply may become inadequate.

It is not intended to make any complete inventory of the resources of each State, but simply to point out the chief factors in the present products. Thus Texas, in addition to the large oil product, has a very great variety of minerals. Most of them are still undeveloped.

Virginia exceeds Maryland in the total of her products on account of her coal, iron ore, manganese, barytes, zinc, salt, etc., and Louisiana ranks with Maryland on account of the recent development of oil and gas. Florida, also, is almost even with the two States last mentioned because of the great product of phosphate rock, though fuller's earth, limestones and kaolin are destined to add much to the general wealth. For mineral fuel, Florida is at the mercy of other States, although valuable peat deposits are available in the lowlands of the east coast and in the Everglades.

The two Carolinas are a great surprise on account of their small total product when one considers the mineral wealth of both and especially their great variety of mineral resources, including gold, tin, iron ores, precious stones, phosphate rock, marls, kaolin, monozite and zircon, soapstone, talc, mica, pyrite, etc., and one of the most desirable advances in mineral development is the use of the potash contained in great quantity in the State's feldspars.

Even Mississippi produces a million dollars worth of mineral products a year, chiefly in clays and limestones. Any considerable increase in the price of iron ores would make her low-grade materials worth concentrating.

The extent to which general industries are dependent upon the mineral resources of the South may be summarized as follows:

**Coal.**—Necessary as fuel for all industries, for the heating of office buildings, hotels and residences, and for cooking. Necessary for the manufacture of gas, and of secondary importance as the source of coal tar products.

**Petroleum.**—Besides its necessity for lamp oils, gasoline and lubricants, oil residues are essential as asphalt roofing, and the quantity which goes into the development of good roads is enormous and increasing. The paraffin wax, especially from oils of the Pennsylvania grade, is tributary to matches,



paraffin paper, candles, laundry work, and no less than twenty other lines of manufacture, among the floor waxes, forms for art castings, modeling wax, etc.

Other oil residues are the coke for tin smelting for electric-light carbons, carbon electrodes, gas oil necessary for increasing the illuminating power of water gas. Lately the use of heavy oils in place of gasoline in internal combustion engines bids fair to outrank the usefulness of gasoline itself. Other possibilities of use for special products are for the manufacture of soap, not only as an addition as in naphtha soap, but the waste products from refining oils are even now manufactured into soap in Europe, and the same will soon be done in this country. Recently the possibility has been demonstrated of converting certain oils directly into good soaps.

The use of certain grades of naphtha as solvents for paints and varnishes has long been known, but lately patents have been issued for varnishes made directly by oxidizing oil residues and heavy oils with nitric acid.

The use of naphtha for cleaning and for extracting oils from seeds, etc., is already well known.

**Natural Gas.**—The value of this fuel does not depend upon its freedom from ash, or solely upon its great heat value, for there are industries such as the manufacture of fine glass which depend upon a pure gas flame with its freedom from soot.

Natural gas is valuable again for making lamp black at reasonable prices.

**Iron Ores.**—It is needless to attempt to present any detailed list of the industries into which iron products are essential, but it is worth while to note that no inconsiderable quantity of iron ore finds utilization without ever being reduced to the metallic state. Sienna, umber and metallic paints are various forms of iron oxides; iron oxide is useful in purifying illuminating gas and as contact material in the manufacture of sulphuric acid, and iron ores are necessary in smelting siliceous ores. Besides the many medicinal preparations of iron, the iron sulphate obtained as a waste product in galvanizing sheet iron, and wire is used in large quantities in settling the impurities of drinking water in the supplies of large cities.

**Copper.**—Besides the varied uses of sheet copper, and of cast copper for bronze and brass, the ores themselves, like iron ores, have many uses, such as in the manufacture of copper, sulphate (blue vitriol) for electric batteries, the manufacture of paints and dyes, Paris green, etc., and in the refining of sulphur oils.

**Lead.**—Lead enters into many of the great chemical industries and is essential as the lining of sulphuric acid chambers, vats for many chemicals, and the ores of lead go into white, yellow and red lead, litharge, chromate of lead and other pigments, besides a host of chemicals.

**Zinc.**—A larger proportion of zinc goes into use without reduction to metal than almost any other metal. Thus zinc white oxide is made direct from the ore, and finds increasing use in white paint where the pressure of hydrogen sulphide would blacken white lead.

**Nickel and Cobalt.**—This industry received contributions for many years from the old lead mines of Mine la Motte, Missouri, and products partly have been exported and partly have aided in the development of the nickel-plating industry, which contributes to almost every line of industrial activity. Meanwhile, cobalt oxide has been of the greatest use in the fine grades of pottery. Lately storage batteries have been devised using these metals, and utilization of the salts of both metals widens constantly.

**Chrome Iron Ore.**—This source of bichromate of potash and nickel is not now produced in the South, but the great industry began in the United States, in Baltimore, from ores mined in the neighborhood, and while that supply has been practically exhausted the industry flourishes from imported ores. The product are used for calico printing in increasing quantity, and if the necessity arose the supply for the North Carolina cotton mills could be obtained from that same State. Chromium pigments permeate the entire paint trade. Further, this metal is of the greatest value in making chrome steel.

**Manganese.**—This was contributed for many years by the South alone; Virginia manganese ores were the source of supply for chemical manufacture all over the Union, and the best qualities were even exported. Then began the use of manganese as spiegel iron and ferro-manganese, and the necessity of drawing on Arkansas and then Cuba for a sufficient supply. Permanganate of potash, manganese borate and perborate are also essentials for other industries.

**Tin.**—Besides tin-plate, pure block tin for pipes, tin bar bronze, etc., in chemical laboratories, tin salts are essential in dyeing. It is remarkable that this metal has been supplied practically entirely from abroad, when certainly a considerable supply could be obtained in North and South Carolina. A certain amount has been obtained from near Gaffney, South Carolina, and by mere surface mining from land which as a cotton patch has run the owner into debt—a debt which was paid off by the profit on one carload of tin ore. It is further remarkable that it was necessary to send this ore to Swansea, England, to have it smelted. The metallic tin was then returned to this country for use, and some of it doubtless returned to its old home as tinplate utensils.

**Limestone.**—Iron and all other forms of smelting, glass and pottery, cement, bleaching powder, plaster, mortar, sugar refining, gas manufacture fertilizers for acid soils, the decomposition of chrome iron ore, monazite and zircon, the manufacture of paper pulp and many smaller industries all depend upon a cheap supply of limestone and lime.

**Building Stones.**—These enter many other industries as material for the construction of plants, and there are many smaller uses calling for special stones, such as slate, soapstone and marble as insulators in electric switchboards, etc.

**Clay Products.**—It is difficult to enumerate the products from clays alone, let alone to show all the industries to which they are tributary. From fire brick in blast furnaces and converters the use extends to vats for acid liquids, insulators, pots to hold molten glass, refractory chemical wares, drain tile, piping, and these products enter somewhere in practically every industry.

**Salt.**—This is not only a necessity of life, and for butter, cheese, dried meats, etc., but it enters the soda, chlorine, glass, pottery, electrical, bromine, smelting and many other industries.

**Phosphate Rock.**—This is the mineral of interest to the farmer. Florida ranks first in its production, all of which comes from the South with the exception of a small amount from the large deposits recently found in Utah and Idaho. It also goes into the manufacture of pure phosphorus and matches and the many other phosphorus industries.

**Graphite, Barytes, Asbestos, Grindstones, Whetstones and Talc** are all simply tributary to various other industries, while mica, formerly so valuable for stoves, is an essential part of electrical armatures and enters as an insulator into many other uses.

**Sulphur.**—This is the fundamental substance for all chemical industries. Its conversion into sulphuric acid is a large industry in itself, but the product is only the first stepping-stone to the manufacture of many other chemical products. Salt cake is sulphate of soda used in glass making, and as the raw material for carbonate of soda it is required in the decomposition of phosphate rock, and in hosts of other activities.

Finally the interdependence of one mineral product upon another must be evident. Thus every increase in the production of basic steel calls for an increase in the production of pig iron, the consumption of scrap iron, of spiegel iron or ferro-manganese, and these call for more iron ore, manganese, coke and limestone. Every increase in fertilizers calls for a proportionate increase in sulphur, phosphate rock and niter.

In many directions the production of a given mineral is limited to the present amount. The market is satisfied, but to increase the consumption it is only necessary to push the production of the commodity to which the mineral is tributary. It may be accepted as generally true that the mineral resources of the South can yield double the present output without strain or waste. The supplies of the South are far beyond the demands of the present or of the immediate future, and their expansion depends simply upon general industrial development. It must be hoped that the increase will really wait on legitimate demand and not be wasted by export.

Considering that the South has in general far more mineral wealth than necessary for self-development, and, in fact, that this is the sole resource of the country for several important minerals, such as sulphur, bauxite and the eastern supply of phosphates, it is evident that the South's mineral wealth is a great national asset.

## The World's Great Asset: Cotton

What it means for the South to hold a practical natural monopoly of the world's cotton production is not generally appreciated nor its potentiality fully grasped. Destroy corn, and you could find a substitute; destroy wheat, and other grains could furnish bread for mankind; but cut short the South's cotton crop by one-half, and the financial and commercial world would stagger; destroy cotton, and civilization would be halted.

Earth has no substitute for cotton.

Cotton, the South's crown of glory, is the one staple which enters into every civilized life; it is needed in the palace of the king as well as in the humblest hut of the peasant; it is the glistening sail alike of the royal pleasure yacht and the ship of commerce; it is essential in the top as well as in the tire of the automobile; it is as vital in the hospital, where it makes possible the surgery of the day, as it is on the tented battlefield; it is the basis of one of the greatest manufacturing industries of the world, employing more than \$3,000,000,000 of capital; it is the dominant power in commerce; it brings to the South from Europe an average of nearly \$2,000,000 a day for every working day in the year.

The value of our cotton exports to Europe annually exceeds the total gold production of the world, and the total value of the crop is about double the combined value of the gold and silver output of all earth. This, the richest possession which a beneficent Creator ever gave to any section of earth, is the great prize which the leading nations of earth have struggled in vain to capture. This fleecy staple makes the study of the South's weather conditions and its labor supply of general interest in every banking house in Europe and America. For a century we have rushed it to market as though eager to be rid of it, and in doing so have permitted Europe to reap the profit which ought to have been ours; and then we wondered why the South did not grow enormously rich out of this supreme advantage over any other part of the world.

But a better day is dawning. This royal king is coming into his own. The ablest scientists are seeking to improve the quality of the seed and the method of cultivation; better fertilization and better cultivation are increasing the yield per acre; experts are working on better machinery to gin and clean and compress it; the world has at last come to recognize that it must pay a good price for cotton, or else its production will not keep pace with the demand. This king of agriculture, king of manufactures, king of foreign commerce, this king of civilization itself, is touching with a magic wand the life of the South and quickening it with a wealth and power worthy of the country which he has chosen to fix as his perpetual abode. Here he promises to forever dominate cotton production and cotton manufacturing, and thus help the South to dominate the wealth and civilization of the world.

# The Line of Future Development of the Southern Iron Industry

By JOHN JERMAIN PORTER, Metallurgical Engineer, of Staunton, Va.

**T**HE South long stood in the unfortunate position of a producer of raw materials for the rest of the world. During the past decade great progress has been made in remedying this condition, and we now have within our own borders many cotton mills, wood-working establishments, foundries and other plants manufacturing finished materials. Nevertheless, much still remains to be done before we will be entirely emancipated from our position as the drudge of the industrial family.

While it is, of course, necessary and desirable to develop natural resources and produce raw materials, the community which stops there, and sends these first products beyond its borders to be worked up into commodities fit for consumption, is, like Esau, selling its birthright for a mess of pottage. A ton of iron ore, when converted into stoves, will have a value of \$40, and will have furnished a day's occupation for 10 men. If, however, it is shipped out of the community as ore it will have brought a return of only \$2, and will have furnished less than one day's occupation for one man. Moreover, the ore, when once taken out, is gone forever. It can never be replaced or the transaction reconsidered. The community is further the loser by the double freight which it pays on the ore shipped out and the stoves brought in again.

In the iron industry this condition has been particularly true. The South has for many years been an important producer of pig-iron, but it is only within the last decade that material progress has been made in working up this pig-iron into more highly finished forms. In times past Southern pig-iron has been sold to Northern foundries at prices which meant the practical giving away of the cream of the ore deposits, and, as a result of this skimming of the cream, the low costs of the nineties can never again be duplicated. The pioneer ironmasters, however, were only the victims of circumstances, and are in no wise to be blamed for this spendthrift waste of the treasures hoarded by Mother Nature. It may even be claimed with some justice that the expenditure was justified by the advertising obtained. Nevertheless, it is a pity that some more tangible compensation was not secured by the community possessing such great potential riches.

Fortunately, the mistakes of the past have been taken to heart, and a saner view is now taken of the benefits to be derived from the development of mineral resources. Not long ago the writer was told by a high railroad official that his road considered it poor policy to encourage the mining of the iron ores along its lines, since present conditions made it necessary to ship them out of their territory for smelting. The long haul would have made the shipment of these ores a source of considerable immediate profit, but the railroad officials realized that in the long run they would lose through impairment of their natural resources without an adequate increase in the wealth and prosperity of the community.

The ironmasters of the South are no longer content with the small and uncertain profits obtained by shipping their pig-iron north as such, but are more and more pursuing the policy of converting it into steel, pipe and other finished and semi-finished materials. It is highly significant that practically all the new iron developments at present in contemplation are considering blast furnaces only in connection with steel works or pipe foundries. A home market is now regarded as essential for success, and thus it is that the development of the Southern iron industry waits and depends upon the development of the home market for pig-iron.

At the present time, although the South contains, 50 per cent. of the total iron resources of the country, it produces only 12½ per cent. of the pig-iron made, and consequently has the resources to very greatly expand its output whenever market conditions warrant. Since everything hinges on this, let us therefore examine the prospects for the future growth of the market for Southern pig-iron.

The market for iron and steel in their ultimate form of finished products comes back chiefly to the question of population, modified by the industrial

development of the community. For the United States the consumption of iron and steel products is in the neighborhood of 650 pounds per capita, while for the whole world it is about 88 pounds per capita. It is undoubtedly true that the per capita consumption of such finished products in the South is somewhat lower than the average for the United States, this being the case on account of the greater proportion of the population being engaged in agriculture and similar pursuits not requiring the use of large amounts of iron and steel.

The case of pig-iron is different, for this commodity is useless except as it forms the raw material for other manufactured products. Its consumption, therefore, bears almost no relation to population, and is directly a function of a special type of industrial development. The per capita consumption of pig-iron in the United States is about 650 pounds, while in the South I estimate that it is not over 150 pounds. The difference represents the backwardness of the South in the manufacture of finished forms of iron and steel.

Evidently, then, the future of the home market for Southern pig-iron depends on two factors. First, the industrial development of this section along the line of manufacture of finished iron and steel products to a point where it can supply its own needs of such products. Second, the growth of the per capita consumption of iron of its population.

To summarize: The present approximate consumption of pig-iron in the South is 1,800,000 tons.

If the South manufactured all the finished iron and steel it now uses it would probably consume not less than 5,000,000 tons of pig-iron.

At the normal per capita consumption the South should use 10,000,000 tons of pig-iron.

The present production of pig-iron in the South is only about 3,500,000 tons.

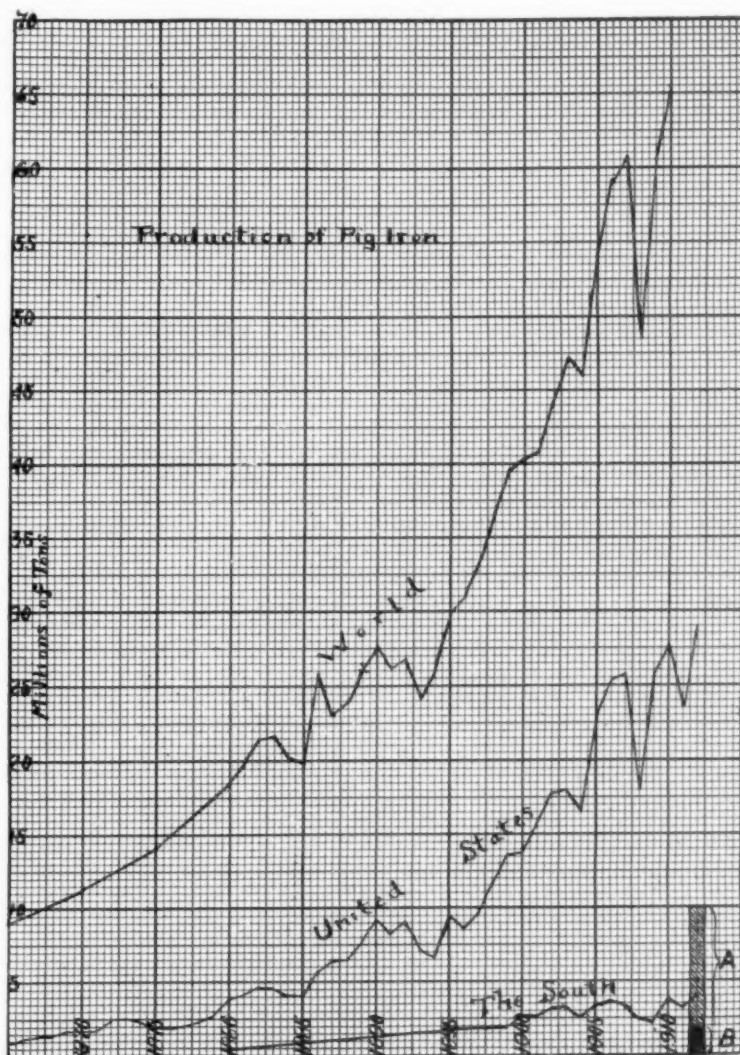
These facts, with some related statistics of the iron industry, are shown graphically in the accompanying diagrams.

It is now clear, I think, that the great need of the Southern iron industry is the development of the home market, which means the manufacturing in the South of all products used by the South—from needles to locomotives and from hardware to rolling mills. If this is done the development of ore resources and the building of blast furnaces will proceed almost automatically, and the commercial associations of the South should clearly understand that the surest way of encouraging iron and steel plants is to encourage the establishment of smaller manufacturing plants which will use their products and provide them with a market.

It is worthy of note that the progress made during the last decade has been chiefly along the line of heavy finished and semi-finished products, such as cast-iron pipe, steel rails, wire bars, etc. This is directly due to the need of the manufacturers of pig-iron for a home market, and in going into the production of finished materials they have naturally selected lines which lend themselves most readily to the consumption of large tonnages of pig. Moreover, it is the natural order of development, for the manufacture of any highly finished product not only uses pig-iron, but almost invariably one or more intermediate or semi-finished products of pig-iron. For example, the maker of ice-cream freezers not only uses pig-iron to make the castings, but also sheet steel for the cans, steel hoops and nails in the tub, and steel wire for the bail—all intermediate products of pig-iron, and nearly all now available from Southern mills.

There are a multitude of lines of finished products which apparently could be manufactured to advantage in the South. It may be profitable to enumerate and discuss some of them.

Cast-iron pipe is a leading Southern product, as shown by the accompanying table, and there are also a number of soil-pipe foundries in addition to the plants here enumerated. Nevertheless there is still room for other pipe works. The Central West and Southwest markets, for example, are inadequately provided for at the present time, and a pipe foundry located with reference both to easy access to this territory and to the supply of Southern pig-iron should be assured of success. St. Louis, or thereabouts, should be an ideal site for a pipe plant if operated in connection with a blast furnace.



A—POTENTIAL CONSUMPTION OF PIG-IRON IN THE SOUTH.  
B—ACTUAL CONSUMPTION OF PIG-IRON IN THE SOUTH.



The South has made considerable progress in steel-making in the last few years, and yet is still far behind its possibilities in this line. Standard and light rails, billets, plates, bars, sheets, wire and wire products are now available, but there are a host of other products, especially in the lighter class of steel manufactures, which must be brought in from the North. Among the steel products which should be manufactured in the South are the following:

Structural shapes; agricultural shapes; merchant pipe; railroad materials—axles, brake beams, rolled steel car wheels, etc.; track supplies—bolts, tie-plates, spikes, splices, etc.; tinplate; galvanized sheets in various forms; fire-box, boiler, saw and other special plates; special sheets—cold-rolled, non-corrosive, blue, electrical, etc.; corrugated sheets, expanded metal lath, etc.; strip steel for stamping, springs, etc.; shafting; nuts, bolts, washers, rivets, wood and machine screws, etc.; horseshoes; wire rope; wire specialties; crucible steel, as tool steel, high-speed steel, etc.; pressed-steel products; stamping works, and additional structural and plate works.

Aside from pipe works, the South is notably deficient in foundries. The recent statistics gathered by "The Foundry" show that in 1912 there were 71 foundries of all classes per million population for the whole United States, while the South possessed only 31 foundries per million. Moreover, it is probable that the average size of the foundries in the South is less than that for the whole country.

There are certain staple foundry products, such as radiators, brake shoes, stoves, etc., which can be made to special advantage in the South, and we may expect to see very rapid growth along this line during the next few years. A large radiator plant is even now starting up in the Birmingham district.

In the matter of general castings, however, the market situation is somewhat as it is with pig-iron. The great majority of castings are not finished, but only semi-finished products, as they have machine work done on them and are used as parts in an infinite variety of construction and machines. Hence the foundry industry must largely wait upon the development of general manufacturing.

The possibilities in the line of general manufacturing are too numerous to permit of their being more than touched upon.

Railroad equipment shops are badly needed. The South has several car works, but needs more, and more particularly one or more additional locomotive works. Eight manufacturers of locomotives advertise in the Manufacturers Record, and, except for the branch of the American Locomotive Co. at Richmond, all of them are located in the North.

Timber is one of the great natural resources of the South, and wood-working establishments are therefore numerous, and will become more so. Hence there is a promising field for manufacturers of woodworking machinery. The field is not entirely unoccupied, there being several very successful Southern concerns in this line, but there is plenty of room for others.

The greatest industry of the South is agriculture, and although there are a number of prosperous manufacturers of agricultural implements here, the bulk of the apparatus used still comes from the North. This condition should not continue. It is not only a failure to realize potential wealth, but the heavy freights are a tax upon our agricultural interests.

There is practically no electrical machinery manufactured in the South, and the greater part of the power plant equipment used still comes from north of the Ohio River.

To the writer it seems that there is a distinct field for a large engineering works in the South. At the present time these works are chiefly concentrated in Pennsylvania and Ohio, and practically all large steam and water-power installations, chemical plant, steel-works equipment, etc., are bought in the North. It is true that there is no line of manufacturing requiring more capital, skill and patience for its successful development, but with the great water-power projects now under way, the promise of extensive chemical industries, and the inevitable expansion in steel and general manufacturing, it would seem that the field was worthy of cultivation.

The South also needs more custom or jobbing plants in certain lines. For example, there are in the whole South (including Missouri) only 34 steel foundries and 15 malleable foundries, as against 78 steel and 26 malleable foundries in the State of Pennsylvania alone. Forge shops and custom galvanizing works may also be mentioned in this connection.

The writer has, in a previous publication, mentioned the desirability of making direct castings at Southern blast furnaces, but it may not be amiss to again emphasize this matter. It is hardly necessary to explain that in this country the foundry industry is entirely separate and distinct from the manu-

facture of pig-iron. Abroad we find foundries and blast furnaces operated together in some cases, but here no attempt has been made to integrate the foundry with the source of its raw material except in one or two isolated cases. The steel industry was once in the same independent position, but now no one would think of operating a large steel works except in connection with its own blast furnaces and ore supply. The foundry is 20 years behind the state of development reached by the steel industry, and should be greatly benefited by a similar process of integration. Development along this line would substitute for a multitude of small, and frequently inefficient plants, a few large plants, which, having ample capital, could afford to use the best of equipment and technical skill.

Conditions in the South are particularly adapted to the use of the direct casting process, and recent improvements in electric furnace construction, etc., have provided means for overcoming the technical difficulties in the way, just as the invention of the basic open-hearth process paved the way for steel-making in the South. The chief difficulty now appears to be the lack of familiarity of foundrymen with the blast furnace business and of blast furnace men with the foundry business. Such products as are made in large quantities, such as soil pipe, radiators, agricultural castings, etc., could most readily be poured direct from blast furnace metal, with a considerable saving in cost and improvement in quality. Unfortunately, cast-iron water pipes are at present barred from this process on account of a senseless provision in the standard specifications to the effect that they must be poured from remelted iron.

The writer in enumerating as he has the industrial needs of the South, does not wish to be understood as intimating that it would be an easy matter to start up any and all of the plants suggested on short notice. On the contrary, it is probable that for several of the lines mentioned the time is not yet ripe for their profitable manufacture in this section, and in all cases the closest study and most careful consideration should be given to all conditions before coming to an irrevocable decision. Particularly it should be remembered that the Southern markets are largely potential rather than actual; hence will often need careful and patient cultivation.

The conditions for a successful manufacturing plant are three in number. In order of increasing importance they are location, capital and the man.

The South offers every advantage in point of location. Cheap raw materials abound, good markets are at hand, fuel is abundant and cheap, labor conditions are good, and, in short, manufacturing conditions are ideal.

These advantages, however, avail nothing if capital for their exploitation is lacking. The South itself has been chronically short of capital ever since the war, and is very largely dependent upon outside help for its development. It is for this reason that its resources and advantages need to be advertised to the outside world.

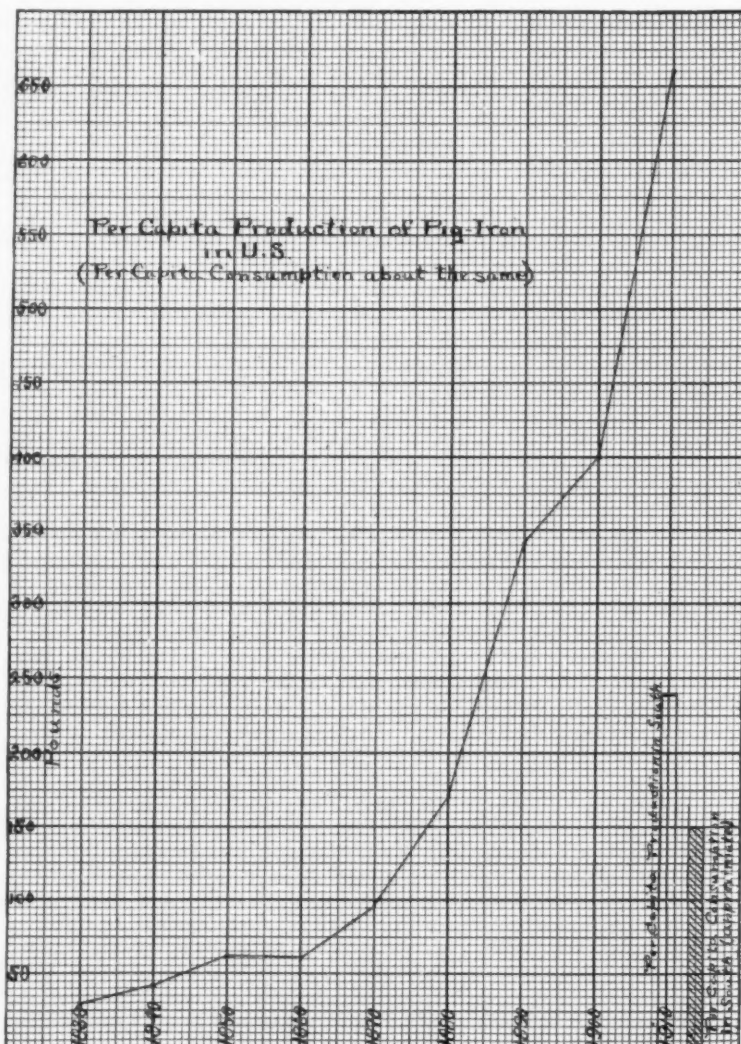
Natural advantages and capital both provided, and there is still something lacking. Without the man

of initiative and knowledge they will remain unemployed and unproductive. Undoubtedly the man is the most important of the three factors. By his ability he may overcome the handicap of poor location, and make the plant successful in spite of all. By his energy he may create capital, starting on a "shoestring" and building up an industry of enormous proportions. But if he is lacking the resources remain unnoticed, the markets unfound and the capital if put into use is dissipated like the morning fog before the rising sun, and leaves as little trace behind it.

After all, the chief need of the South is for men—men of ability, knowledge and initiative. A few such men have accomplished wonders in the past, and will do more in the future. Let us all strive to emulate them.

#### PECAN GROWING IN THE SOUTH.

Five years ago reports from 600 pecan orchards in the South showed a total of 300,000 trees then under cultivation, with nearly seven-eighths of the total in ten States distributed about as follows: Florida, 52,000; Georgia, 35,000; Louisiana, 29,000; Mississippi, 27,000; Alabama, 23,000; Texas, 15,000; South Carolina, 4,000; Virginia, 2,500; North Carolina, 1,000, and Oklahoma, 1,000. The relative positions of these States may have changed somewhat since then, as in the past five or six years more than 1,500,000 trees have been sold from the nurseries to the principal pecan-growing States. These sales indicate the wide interest in the commercial growing of the pecan, which is still in its infancy. Large tracts of land in Southern Mississippi, Southern Alabama, Central and Southern Georgia, Northern Florida and Eastern Texas are being planted in the nut trees.



# The Iron and Steel Possibilities of the South

By EDWIN C. ECKEL, Mining Geologist, Washington, D. C.



N taking up this subject it has seemed best to commence by summarizing the manner in which the present Southern iron development has been brought about and its relations in the past to iron and steel development elsewhere in the United States. The available supplies of raw materials—both ores and fuels—are then taken up, in order to secure some idea of how their abundance is likely to affect the future growth of the industries based on them. These basal conditions cleared up, it will then be possible to discuss the question of markets, both with regard to market conditions in the past and with regard to probable future developments in this line.

## THE GROWTH OF THE INDUSTRY, 1810-1912.

Statistics relative to the iron production of the United States during the period from the Revolution until after the close of the Civil War are scanty and difficult to handle. The chief difficulty arises from the fact that in most of the earlier statements as to production there is confusion between pig-iron, blooms made direct from ore, and iron wrought from the pig. In the South, where both forges and bloomeries were in operation until very recent years, the opportunities for error are particularly great.

So far as can be determined, the Southern States made almost exactly one-fifth of the total iron produced in 1810, and this proportion increased quite steadily, reaching its maximum probably between 1840 and 1850. From this date on the Southern share of the total dropped rapidly, for the Michigan ranges were now beginning to ship heavily to Northern and Eastern furnaces. The data available for 1810 and for the two decades preceding the war are as follows:

Date.	United States Output, Tons.	Southern Output, Tons.	Southern Percentage of Total.
1810	53,908	*	18.1%
1840	286,903	*	25.9%
1850	563,755	131,541	23.4%
1854	724,000	130,198	17.9%
1856	812,000	124,752	15.3%
1860	987,559	*	12.8%

\*Calculated from ore consumption or value of product.

The history of the Southern iron and steel industry during the war has never been written, though scattered details concerning its development in individual States can be found in different volumes, and Miss Arnes has given us an adequate and interesting discussion of its status in Alabama. Here it need only be said that war was a harsh and pressing schoolmaster, and that the wonder is that Southern legislators have so soon forgotten the lesson then impressed. As early as the fall of 1861 it was understood that man cannot live by cotton alone, and that in modern war courage and devotion must be reinforced by material supplies if a long struggle is to be successfully prosecuted. Under the encouraging influence of the coast blockade, which was as successful as a high tariff in preventing imports, the industries of the South, heretofore neglected in favor of agriculture, grew at a really remarkable rate. Had these favoring conditions persisted, it is certain that the South would now be a great manufacturing nation and that many idle economic theories would be looked upon as outgrown.

But the development thus started was not to continue at that time. The battles of 1862 resulted in the practical isolation of the Southwestern States and in the destruction of the West Tennessee iron industry. The furnaces and mills of Southwestern Virginia and Northwest Georgia kept in operation, with few exceptions, until the summer of 1864, while Brierfield and other Alabama furnaces and the Selma works held on until the closing days in the spring of 1865. As to the output, few definite data are available. In 1860 the Southern States were making somewhat over 120,000 tons of pig-iron annually. It is probable that during 1861 and 1862 this was greatly exceeded, but from that time on the output fell off as furnaces and mills were destroyed. I have assumed that in 1865 the South was not making over 5 per cent. of the American total, even allowing for the fact that the Maryland, Kentucky and Missouri furnaces had mostly escaped interference throughout the war.

The recovery after peace came was not so sudden as has been intimated by popular essayists. We know that the ghastly farce called Reconstruction did not, in fact, look toward the physical reconstruction of the ruined Commonwealths, and so far as individual effort was concerned food supplies and readily salable cotton were more important than manufactures. In 1870, at any rate, the South had recovered only so far as to produce a little over 8 per cent. of the American total iron output. But in the decade which followed progress was much more rapid, so that by 1875 the Southern proportion had risen to over 12 per cent., which was about held in 1880.

From this time on there has been an almost uninterrupted growth in the annual output of Southern pig-iron up to the present day, the temporary decreases shown during bad business years being unimportant. The proportion which this Southern output bears to the American total, however, has shown greater variations. From 1880 on this proportion increased quite regularly, reaching in 1893 its maximum of 22½ per cent. After that date the ratio decreased, and during the past eight years it has ranged between 12 and 15 per cent. of the total output of the United States.

## PIG-IRON OUTPUT, 1880-1910.

Year.	Totals.		Ratio, Southern to Total.
	United States.	South.	
1880	3,835,191	448,978	11.7%
1885	4,044,526	682,359	16.9%
1890	9,202,703	1,833,937	19.9%
1891	8,279,870	1,738,194	21.0%
1892	9,157,000	1,947,187	21.3%
1893	7,124,502	1,599,659	22.5%
1894	6,657,388	1,274,947	19.2%
1895	9,446,308	1,729,606	18.3%
1896	8,623,127	1,846,999	21.4%
1897	9,652,680	1,937,229	20.1%
1898	11,773,934	2,133,514	18.1%
1899	13,620,703	2,398,881	17.6%
1900	13,789,242	2,642,720	19.1%
1901	15,878,354	2,626,387	16.6%
1902	17,821,307	3,085,957	17.3%
1903	18,009,252	3,287,522	18.3%
1904	16,497,033	2,775,215	16.8%
1905	22,992,380	3,279,370	14.3%
1906	25,307,191	3,525,119	13.9%
1907	25,781,361	3,493,772	13.7%
1908	15,936,018	2,369,741	14.9%
1909	25,795,471	3,188,091	12.4%
1910	27,303,567	3,447,291	12.6%

The actual tonnage annually produced in the South has increased since 1880 from less than 500,000 tons to considerably over 3,000,000 tons. The Northern output, however, has increased at practically a similar rate, so that in 1912 the South shows little or no proportionate advance from its relative position in 1880, and a distinct falling off from the relative position which it had assumed during the early nineties. It is clear enough that the relative decrease shown during the years from 1893 to 1905 was due in most part to the opening of the Mesabi range in Minnesota, which since 1892 has been sending down a steadily increasing tonnage of ore to Eastern furnaces. For the past eight years, as has been previously noted, the South has just about maintained its comparative position. It will be of interest if we can determine, from some study of the raw materials and markets available, what the probabilities are as to the future growth, both relative and actual, of the Southern iron and steel industries.

## THE SOUTHERN ORE SUPPLY.

The most important of the raw materials used in the iron industry is, of course, iron ore itself, and a shortage in the ore supply would set a very definite limit on the possible growth of the steel industry. It would be possible, even with a local deficiency of ore, to import foreign ores for use with local coke, and it need hardly be pointed out that Southern ports are well located for the development of an assembling proposition of this type. But, as will be seen, the domestic iron-ore supplies of the South are so large and so conveniently located with respect to fuel that they can of themselves support a steel industry much larger than is now in existence or in prospect.

In an article recently published\* the iron-ore fields of the Southern States have been described in some detail, but in this more general discussion it will be possible only to summarize briefly the chief points which bear on the subject immediately under consideration.

Of the 16 States included in this review as "Southern," 10 are at the present time more or less important shippers of iron ore. Of the remaining six, where no iron mines are at present operated, one (Florida) is not known to contain any workable deposits; two (Mississippi and Louisiana) contain workable but relatively unimportant deposits, while South Carolina, Arkansas and Oklahoma offer distinctly more hope of ultimately entering the producing class.

The following table has been prepared in order to put the principal facts regarding distribution of iron ores in the South into compact form. In this summary S denotes that shipments were actually made in recent years, U that workable but practically undeveloped deposits are known to exist, and O that no ore of this type is known to occur in the given State. When the deposits are of importance, whether now worked or not, the proper letter (S or U) is used, in italics:

State.	Magnetite.	Specular Hematite.	Clinton or Red Hematite.	Brown Ore.
Alabama	U	U	S	S
Arkansas	U	U	O	U
Florida	O	O	O	O
Georgia	U	U	S	S
Kentucky	O	O	S	S
Louisiana	O	O	O	U
Maryland	U	U	U	S
Mississippi	O	O	O	U
Missouri	S	S	O	S
North Carolina	S	U	O	U
Oklahoma	U	U	O	U
South Carolina	U	O	O	O
Tennessee	U	O	S	S
Texas	U	U	O	S
Virginia	S	S	U	S
West Virginia	O	O	U	S

The most important question relative to the Southern iron-ore situation, from the viewpoint of future steel possibilities, is perhaps that regarding the

\*"The Iron Ores of the South," *Iron Trade Review*, January 2, 1912.



total tonnage of ore which may be considered available. On this point we have several estimates, differing quite widely, but whose totals are all of about the same degree of magnitude. The estimate by Hayes, published in 1909 by the United States Geological Survey, credited the South with slightly over 850,000,000 tons of strictly available ore, in addition to about 1,850,000,000 tons of ore which Hayes considered not immediately available. The estimate by Messrs. Birkinbine and Butler, published at about the same time, placed the available Southern tonnage at about 1,815,000,000 tons. In a recent discussion\* of this subject I have suggested reasons for increasing previous estimates as to Southern tonnage, if it is to be compared directly with estimates of Lake tonnage, and have placed my own figures for minimum available Southern tonnage at 2,600,000,000 tons. There is no need to go into the matter in detail in the present place, but it can safely be assumed that there are at least several thousand million tons of ore in the South of a grade which would be workable during any reasonably good business year.

The point to which attention should be directed is the rate at which this tonnage is being used. During 1910, a year of heavy shipments, the Southern mines contributed about 7,000,000 tons of ore, and it is unlikely that 1912 will show any heavy increase over these figures. At this rate the Southern ore reserves would last some 300 or 400 years; and even if we assume that there will be a rapid and great expansion in Southern iron production, it is obvious that it will be many years before exhaustion of the ore supply will be any factor in limiting this growth.

#### THE SOUTHERN COAL RESERVES.

So far as supplies of coal are concerned, the South has little reason to avoid comparison with any of the States east of the Great Plains, and when we discuss the prospects of American steel development we may, for all practical purposes, disregard the States west of the Missouri River. In the present paper, therefore, the comparisons made will refer only to the area east of the 100th meridian.

The latest figures on coal reserves which are available at the date of writing are the summaries by E. W. Parker, published in the annual volume, "Mineral Resources of the United States for 1911." In his report on coal for that year Mr. Parker furnishes data on the unmined coal tonnages still remaining in the various States. These figures I have rearranged so as to better serve the purposes of the present discussion.

At the close of 1911 the Geological Survey estimates that there were still remaining in the United States, excluding Alaska, somewhat over 3,000,000,000 tons of coal of all kinds. Of this enormous reserve, practically two-thirds exists in the area west of the 100th meridian, including the States of the Great Plains, the Rocky Mountains, the Great Basin and the Pacific Coast. As a basis for general manufacturing this far Western tonnage is highly important, but as related to a possible steel industry it becomes almost negligible, for, unfortunately, it is not balanced by a corresponding development of iron ores in the Western country. So that in our present discussion we may fairly disregard the Western coal reserves and concentrate attention on the unmined coal tonnage which still exists in the States east of the Great Plains.

In the portion of the United States to which our attention is thus limited the Geological Survey estimates a total coal reserve of slightly over 1,000,000,000 tons. About half of this total occurs in the Southern States, as that term is applied throughout this publication. The exact division by States is as follows:

COAL RESERVES OF THE SOUTH.	
State.	Tons.
Alabama .....	68,572,000,000
Arkansas .....	1,839,000,000
Georgia .....	920,000,000
Kentucky .....	103,771,000,000
Maryland .....	7,795,000,000
Missouri .....	39,833,000,000
North Carolina .....	199,000,000
Oklahoma .....	79,201,000,000
Tennessee .....	25,499,000,000
Texas .....	30,967,000,000
Virginia .....	22,380,000,000
West Virginia .....	149,026,000,000
Total Southern coal reserve.....	530,002,000,000

Of this total tonnage practically all is good bituminous coal, though the Texas total includes a notable proportion of lignite. In the other States, however, we may fairly consider that all of the tonnage estimated is coal suitable for general manufacturing uses, that most of it can be coked if proper processes be used, and that a very large proportion of it is strictly "coking coal" as that term is applied today by those who still think in terms of the beehive oven.

During 1911 the Southern States mined 117,625,019 tons of coal. At this rate of consumption the Southern coal supply would last for some 3000 or 4000 years, so that we can contemplate a considerable increase in the rate of Southern coal mining without becoming alarmed over the impending exhaustion of the coal supply. Even an ardent conservationist would find it difficult to really make much capital out of figures of this type.

It is clear that the coal reserves of the South are so large that exhaustion of the coal supply will not be the factor to bring about a slowing down in the rate of Southern steel development. The coal supplies of this section are far beyond any probable future requirements of its iron industry; they are well distributed throughout the various States, and they include a far larger proportion of strictly "coking coal" than do the reserves of any other section of the United States.

\*"Extent and Duration of American Iron Ore Reserves," *Engineering Magazine*, September, 1912.

#### MARKET CONDITIONS IN THE PAST.

Three features stand out prominently when the Southern iron industry is studied from a commercial standpoint. These are: (1) that until very recently all of the Southern output was marketed in the form of pig-iron, and that even now most of it is still sold in that form; (2) that the bulk of the output is marketed at points far from the furnace and is subject to heavy freight charges, and (3) that the market price of Southern pig is always lower, and usually much lower, than that of similar grades at Northern and Eastern furnaces. These three points of interest may be separately discussed, though they are all interrelated very closely.

(1) The South has always been an important producer of foundry irons, while a considerable tonnage of steel-making pig has been shipped from Virginia for conversion elsewhere. As a result even at present considerably less than half of the total pig-iron produced in the South is converted into steel at Southern plants, while until quite recently the proportion thus converted locally was even less important. Of course, so long as the acid Bessemer process was the principal steel-making method, this condition could not be changed, for low-phosphorus ores are almost non-existent in the South. But as things stand now this difficulty is done away with to a large extent, and the further development of Southern steel-making will be limited not by technical factors, but by questions of capital and markets. If the market becomes broad enough to justify it, we may expect that capital will in time be provided to erect steel-making and finishing plants for such furnace groups as have supplies of ore and coal sufficient to justify the increased investment.

(2) The fact that local foundry development was never sufficient to take up any large proportion of the pig-iron produced in the South had, of course, the effect of forcing Southern furnaces to ship North and West into competitive markets. Even now, with a fair degree of steel production in the South, a large portion of Southern pig metal still goes to very distant markets. The extent to which this distant shipping was carried on can be best understood if we take up a specific case, and, fortunately, the statistics for one of the largest Southern companies are available.

For many years the company in question has been one of the largest pig-iron producers in the South. During quite recent years it has also become a steel producer, but during its early history all of its product was marketed as pig-iron. Its actual pig-iron sales now are relatively small in ordinary years, though the possibility that they will be made exerts an influence over Southern conditions. The following detailed figures of its production and shipments to various markets during 1888 and 1899 are probably fairly representative of general Southern shipments during those years. They have been also reduced to percentages for convenience of comparison:

Destination.	1888.		1899.	
	Tons Shipped.	Per Cent.	Tons Shipped.	Per Cent.
New York and New England.....	30,567	14	75,270	10
Pennsylvania, Ohio, Indiana, Illinois, etc..	138,481	62	485,090	63
Southern States.....	50,406	22	102,735	13
Western and Pacific States.....	5,305	2	28,735	4
Foreign shipments.....	..	..	75,390	10
Total shipments.....	224,759	100	767,220	100

Though the management of the company pointed to these exhibits with evident pride, it is clear enough that they were not really things to be proud of, and that the distribution of shipments shown in them gives some clue to the relatively slow growth of the Southern iron industry in general. During later years things improved in this regard, and for 1907 the same company distributed its total product as follows:

	Tons.
Sold as pig-iron.....	315,573
Converted into steel.....	287,254
Total iron output.....	602,827

It is probably correct enough to say that of its total iron output 60 per cent. or more was in 1907 used locally as compared with the 13 per cent. used in 1899. In the past few years the percentage converted or sold locally has grown still higher, and hereafter it is probable that in good business years the entire output will be locally used.

(3) This particular instance has been followed out in detail because the exact figures happen to be available, but it throws light on general conditions in the Southern industry during the past few decades. Iron has been produced cheaply and shipped to great distances in order to find a sufficiently broad market. This brings us directly to the price question.

It might, of course, be said that distant shipment does not affect prices, since prices are quoted at furnace and freight rates are added to these base prices. This would be true enough if only a small proportion of the total output of any district was sold at distant markets. But when, as in the case of Southern iron, practically all of the output was sold in distant markets in direct competition with Northern irons, the Birmingham price was practically the Northern market price less freight. All the advantages of cheap raw materials and low assembling costs were thrown away as soon as the bulk of the product was shipped into distant competitive markets, and Southern furnaces have in consequence shown less profits than those in the North. The prospects of improvement in this regard will be noted later.

#### FUTURE MARKET POSSIBILITIES.

In discussing the market conditions which have limited Southern iron development in the past we have in reality outlined many of the points on which the hope of future growth must depend. It is clear enough that the Southern supply of raw materials is sufficient to justify a far greater iron output than now exists. It is also clear that pig-iron can be made cheaply at several points in the South, though this fact is no justification for also selling it cheaply.

And as regards the fact itself, unusually low figures of cost must be accepted with some caution. A company which runs its furnaces without lining or its mines without roofs can show good paper costs for a time, but there is a natural limit to that sort of thing, and if it is practiced too long the receivers are apt to have a bad mess to clear up. There has been a good deal of misunderstanding concerning low-cost Southern iron in the past, but this is disappearing as accounting methods are becoming more uniform.

For our present purposes we may assume that the bulk of the Southern tonnage is produced at a total cost several dollars per ton cheaper than the bulk of Northern iron, but that market conditions in the past have been such that this lower cost did not mean higher or even equal profits per ton. It is evident that even with an ample supply of raw materials it would be difficult to find capital to finance any large expansion of the industry under such conditions. Growth of the Southern steel and iron foundry must depend on improvement of conditions in the territory naturally tributary to Southern furnaces and mills, so that this territory is capable of absorbing an increased output at somewhat fairer prices than have prevailed in the past.

The Southern States themselves contain slightly over one-third of the population of the entire United States. Of course, some of the South can be reached most economically from Northern points, but, on the other hand, Alabama mills have some natural territory in the West, and Virginia and Maryland have market areas to the northward. So that in any general consideration of the matter we may safely assume that the territory naturally tributary to Southern furnaces and mills contains one-third of the American population. But it is often overlooked that, in other regards, it is not average market ground. Its agricultural values are high, but its manufacturing is still relatively deficient; its railroad mileage until recently was below the average, and in some other respects it has in the past had less need for iron and steel per capita than the remainder of the United States. These facts are conveniently summarized in the following table, which also serves to indicate how conditions are changing in these regards:

SOUTHERN MARKET FACTORS, 1880-1910.

	1880.	1890.	1900.	1910.
Population, total....	18,614,925	22,538,751	27,445,457	32,480,343
Per cent., U. S.	36.9%	35.8%	36.1%	35.3%
Railroad mileage, total miles.....	24,866	50,350	61,880	87,084
Per cent., U. S.	26.7%	30.2%	31.8%	35.5%
Capital in manufactures.....	\$329,753,000	\$848,868,000	\$1,408,866,000	\$2,884,666,000
Per cent., U. S.	11.8%	13.0%	14.3%	15.5%
Annual manufactured products.....	\$622,840,000	\$1,242,581,000	\$1,860,113,000	\$3,158,107,000
Per cent., U. S.	11.6%	13.2%	14.3%	15.2%
Coal production, tons.	7,002,254	24,925,345	54,510,460	120,856,340
Per cent., U. S.	9.8%	15.8%	20.2%	24.1%
Pig-iron output, tons.	448,978	1,833,937	2,642,720	3,447,291
Per cent., U. S.	11.7%	19.9%	19.1%	12.6%

On examining the data presented in the foregoing table it will be seen that the Southern States have held their relative proportion of the total population quite steadily, showing only slight changes in this regard over the past 30 years. But in the factors which make for increased iron and steel consump-

tion they have advanced very rapidly. Railroad mileage has increased from 26.7 per cent. of the American total in 1880 to 35.5 per cent. in 1910, and the relative gains in both the capital invested in manufacturing industries and in the total annual production of those industries has been particularly marked. Concurrently with these advances in industrial development, the coal production of the South has gained remarkably as compared with that of the remainder of the United States. The iron production alone has shown no serious gain in relative status, and this fact of itself is sufficient to indicate that the Southern iron market is far from being overbuilt at the present moment. With such rapid increases in general manufacturing and coal output, and with the increased railroad mileage which these advances will, in turn, require, it seems clear that the territory strictly tributary to Southern mills and furnaces is gaining rapidly in its capacity for iron and steel consumption, and that there is every reason to believe that this gain will continue in the future. This implies that heavily increased productive capacity must be supplied very shortly, with the prospect that the returns on investment in such increased furnace and mill capacity will be attractive enough to stimulate investment.

The normal growth of the industry will in future be more or less regular, its fluctuations depending principally on general business conditions throughout the United States. In addition to this regular growth, however, the fact must not be overlooked that at intervals much more striking and irregular changes in market conditions may be expected. Two such important changes are at present in prospect, dependent, respectively, upon prospective tariff changes and on the completion of the Panama Canal. It may be well to suggest briefly how each of these factors seems likely to affect the growth of the Southern iron and steel industry. In order to dispose of the two factors in the most encouraging order, we may take up the tariff first and the canal later.

The Southern furnaces and mills have always had a considerable market in the States bordering on the Pacific, an area which is practically treated like export territory so far as marketing conditions are concerned. In this territory Birmingham pig-iron meets foreign metal, the imported product being principally Scotch, English and Chinese. As time goes on the proportion of the latter may be expected to increase, for next to Germany our principal competitor of the future will probably be China, so far as iron and steel production is concerned. The Pacific Coast market can be reached, under existing tariff conditions, at a profit, though not at a very remarkable one. If, however, the iron and steel tariffs be reduced to a point which will satisfy Eastern consumers, the Pacific Coast will have to be abandoned entirely by American furnaces and mills. This statement, in fact, applies not only to iron and steel products, but to a considerable number of other bulky manufactured staples.

The effects of the tariff change may, on the other hand, be modified to some extent by the completion of the Panama Canal. It is too soon to speculate on the freight rates which may be established for shipments to our own coast, and we can only hope that they may in some cases aid Eastern and Southern mills in holding some share of the Pacific Coast business. With regard to other market areas, however, there is little reason to doubt the good effects of the canal. It is certain that its opening will advance trade relations with the west coast of Central and South America, and it is equally certain that Southern mills will derive the greatest benefit from increased trade in these particular markets. Thanks to our coastwise navigation laws, it is often cheaper to ship to a foreign country than to an American port an equal distance away.

## Coal Area of South as Compared With Europe

### Production and Potentialities of the South's Coal Fields\*

By EDWARD W. PARKER of the United States Geological Survey.

**P**RIOR to the war between the States, the Commonwealths lying south of the Mason and Dixon line and of the Ohio River depended almost exclusively upon the products of the surface of the earth for their existence. Cotton was king, and with corn and cane formed the triumvirate that ruled the industrial life of the South. The abundant forests not only furnished the fuel for domestic use, but supplied such limited demand as was created by the scattered factories and the rail and water transportation interests. Many of the readers of this issue of the *Manufacturers Record* will remember the "wood burners" that hauled the slow-moving, frequent-stopping trains of thirty or forty years ago. In most of the States mining of any kind was almost unknown. Up to 1870 the total coal production of the Southern States had amounted to less than 50,000,000 short tons, and 70 per cent. of this had been taken from the mines of Maryland and of the northern counties of that part of Virginia which since 1863 has been included in her offspring, West Virginia.

The development of the South in the past forty years of its existence is unparalleled in the history of the world. And if, as Patrick Henry has suggested, the history of the past is the lamp that illumines the path of the future, the Southern States may contemplate the coming years with a confidence that is not misplaced. It is difficult to realize that Alabama, whose total production of coal up to 1870 was less than 200,000 tons, has produced in the last forty years over 220,000,000 tons, and that more than 55 per cent. of this has been mined in the last decade. Forty years ago Oklahoma, then the Indian Territory, which mined no coal on a commercial scale prior to 1870, and less than 300,000 tons from 1872 to 1881, produced over 30,000,000 tons in the last ten years and over 51,000,000 tons in the last forty years. Arkansas' total production was less than 500 tons prior to 1870, and over 32,000,000 tons

in the last decade. West Virginia in the second decade of its State history produced about 12,000,000 tons, and in the last ten years, from 1902 to 1911, she produced over 430,000,000 tons, and in the last forty years has yielded nearly 650,000,000 tons. These are simply a few striking instances of the development of the individual States. The growth of coal production in the South, as a whole, and when compared with that of the rest of the United States and with the countries of Europe, presents equally interesting material for contemplation. As already stated, the total production of this region prior to 1870 was less than 50,000,000 tons; in the last forty years it has reached the enormous total of nearly 1,500,000,000. In the ten years from 1872 to 1881 the Southern States produced about 57,500,000 tons; in the last ten years they produced over 860,000,000 tons. The total production in all other States has grown in the same period from 554,000,000 tons to 3,310,000,000 tons. In other words, the coal production of the United States exclusive of the Southern States in the later period was six times that of the earlier, while the growth in the Southern States is represented by the multiple of 15. The percentage of the total production credited to the Southern States in the earlier period was less than nine; in the last ten years it was 26. The total production of the principal countries of Europe in the same length of time has grown from 2,600,000,000 tons to 6,345,600,000 tons, the latter figure being less than two and a half times the former.

So much for the past. The present is taking care of itself, and so far as the Southern States are concerned the future holds no terrors. If we compare the coal production of the Southern States with that of all Europe during the last forty years, we find that in each decade the tonnage from the former has increased something more than 100 per cent., while that of Europe has increased between 30 and 40 per cent. If the curves thus created are projected into the future we find that although the European production in the

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decade earlier than 1911 was a little more than seven times that of the Southern States, still at the end of the next fifty years the Southern States would be producing as much coal as all of Europe, including Great Britain. The question then naturally arises as to whether the Southern States possesses the reserves from which such a production could be obtained. Official estimates of the available supplies of coal in the United States have been made by the United States Geological Survey and are probably as reliable as any that have been made for other countries—doubtless they are more reliable than any in existence for any European country except Great Britain, for which estimates were prepared by the Royal Commission on Coal Supplies. This report was made in 1905, and so far as the writer is informed was the first attempt by a government agency to secure any estimates on the fuel supplies for future use. Following this, Mr. M. R. Campbell of the United States Geological Survey prepared estimates of the coal supplies of the United States, which, with a map of the coal areas, was published in 1908. Mr. Campbell's estimates for some of the Western States have been revised as a result of later study and more complete information, but those of the Southern States have not been materially changed. These show that the known coal fields of the Southern States occupy areas aggregating about 88,000 square miles, in addition to which may be added between 10,000 and 12,000 square miles of country about which little is known, but which are believed to contain workable coal. Nor do these estimates include something over 80,000 square miles of territory lying in Alabama, Mississippi, Louisiana, Texas (Texas alone contains 53,000 miles of this territory) and Arkansas, supposed to contain workable beds of lignite, whose potentialities for the future are believed to be enormous, but which because of the large supply of higher grade and cheap, true coals are largely undeveloped and will probably lie dormant for some years to come unless the gas producer or some other process for their utilization gives them a better competitive standing with the other fuels. Considering only the known fields, we find that the coal areas of the Southern States exceed those of all Europe by approximately 100 per cent., compilations from such data as are available showing the total coal areas in Europe to be about 44,000 square miles. Of this amount, 20,000 square miles, or nearly one-half, are in Russia, and are relatively lean in coal, the supplies being estimated at twenty billion tons. The Royal Commission on Coal Supplies of Great Britain estimated that in areas aggregating 12,000 square miles the coal reserves amounted to about 160,000,000,000 long tons, or say, 180,000,000,000 short tons. Germany's areas are small, estimated at 1700 square miles, but the fields are rich and the supplies are estimated at only a little less than those of Great Britain, or at 164,000,000,000 tons. France is said to have 2500 square miles of coal fields; Austria-Hungary 1800 square miles and Belgium 500 square miles with reserves of 16,000,000,000 or 17,000,000,000 tons each. Spain has about 5500 square miles of coal areas, but like Russia they are lean and are estimated to contain only about 4,000,000,000 tons. Italy produces only lignite, and the output is unimportant.

The combined coal supplies of the countries mentioned above amount to 418,000,000,000 tons. Mr. Campbell's estimates place the total reserves of the Southern States in the known coal fields (and these include only 2000 square miles of the 55,000 square miles of lignite in Texas and none in the other States) at 530,000,000,000 tons—over 25 per cent. more than those of all Europe. The supplies in the Southern States are nearly four times those of England and more than four times those of Germany, but they have not been, nor are they being, drained at the same rate. During the last ten years Great Britain has produced 2,800,000,000 tons and Germany 2,150,000,000 tons. The Southern States produced in the same time 862,000,000 tons, less than one-fourth that of Great Britain and less than one-third that of Germany. Since 1872 the drain upon the coal reserves of the Southern States has been 1,460,000,000 tons, while the drain upon the European supplies has been nearly twelve times as

great, or 17,000,000,000 tons—enough to exhaust the entire supplies of France, Austria-Hungary or Belgium. The total production of the Southern States to the close of 1911 has been less than three-tenths of one per cent., and the average annual production of the last ten years has been at the rate of .02 of 1 per cent. of the supplies. In the last forty years the production of Europe has reduced the "stock on hand" by a little more than 4 per cent., and the average annual production in the last decade has been at the rate of about .15 of 1 per cent.

The accompanying diagram shows the areas in square miles of the coal fields of Great Britain and Germany compared with the rest of Europe, and of Great Britain, Germany, all Europe exclusive of Russia, and all Europe including Russia, compared with those of the Southern States. They foretell the possibilities of the South's future with little aid from the writer's pen.

#### Coal Production of the Southern States for the Last Forty Years By Decades and States.

	1872-81.	1882-91.	1892-1901.	1902-11.	Total.
	Short Tons.	Short Tons.	Short Tons.	Short Tons.	Short Tons.
Alabama.....	1,735,172	26,269,173	64,021,693	128,936,352	220,962,390
Arkansas.....	34,778	2,003,322	9,065,947	21,120,195	32,224,242
Georgia.....	1,025,644	1,956,986	2,773,442	3,079,197	8,835,269
Kentucky.....	7,219,088	20,170,505	38,731,142	99,994,887	166,115,622
Maryland.....	24,583,348	29,023,311	41,759,175	49,311,270	144,677,104
Missouri.....	10,033,984	27,527,533	28,302,317	37,853,255	103,717,089
N. Carolina....	22,650	33,589	162,697	48,986	267,922
Oklahoma.....	270,947	6,170,570	14,591,620	30,599,839	51,632,976
Texas.....		974,756	6,283,951	14,772,827	22,031,534
Virginia.....	559,719	6,236,410	15,916,668	45,670,182	68,382,979
W. Virginia....	11,985,844	48,538,310	153,257,109	430,737,994	644,519,257

Total S. States. 57,471,174 168,904,465 374,865,761 862,124,984 1,463,366,384  
All other States. 553,724,704 1,142,227,835 1,779,591,998 3,310,356,466 6,785,901,003

United States.. 611,195,878 1,311,132,300 2,154,457,759 4,172,481,450 8,249,267,387

#### Coal Production of the Principal Countries of Europe During the Last Forty Years By Decades.

	1872-81.	1882-91.	1892-1901.	1902-11.	Total.
G. Britain....	1,509,609,180	1,874,801,769	2,226,370,720	2,807,269,836	8,418,051,505
Germany.....	557,160,875	862,069,877	1,314,413,638	2,152,639,499	4,886,283,889
France.....	192,440,888	244,406,091	328,679,627	396,119,268	1,161,645,874
Belgium.....	168,928,886	205,122,415	234,062,784	255,687,041	863,801,126
Austria.....	142,904,880	241,681,920	385,673,065	500,356,196	1,270,616,061
Russia.....	22,839,281	53,238,751	122,884,070	233,226,438	432,188,540
	2,593,883,990	3,481,320,823	4,612,083,904	6,345,298,278	17,032,586,995

#### Areas and Supplies of the Principal Coal Producing Countries of Europe.

	Coal Area. Square Miles.	Supplies. Short Tons.
Great Britain.....	12,000	180,000,000,000
Germany.....	1,700	164,000,000,000
Russia.....	20,000	20,000,000,000
France.....	2,500	17,000,000,000
Austria-Hungary.....	1,800	17,000,000,000
Belgium.....	500	16,000,000,000
Spain.....	5,500	4,000,000,000
	44,000	418,000,000,000
Southern States.....	87,516	530,012,285,000

#### COAL AREA OF SOUTH COMPARED WITH EUROPEAN COUNTRIES

GREAT BRITAIN.....	12,000 SQUARE MILES
SOUTHERN STATES.....	87,516 SQUARE MILES
GERMANY.....	1,700 SQUARE MILES
SOUTHERN STATES.....	87,516 SQUARE MILES
ALL EUROPE EXCLUSIVE OF RUSSIA.....	24,000 SQUARE MILES
SOUTHERN STATES.....	87,516 SQUARE MILES
ALL EUROPE.....	44,000 SQUARE MILES
SOUTHERN STATES.....	87,516 SQUARE MILES

# Timber Resources of the South

By HU MAXWELL.



THE South is now supplying more than 23,000,000,000 feet of lumber a year for the industries of this country and for export. The value of this product at the mills is about \$350,000,000, or slightly under \$15 a thousand feet. The number of sawmills contributing to the output exceed 18,000. The figures for 1909 show that the cut of hardwoods was 5,631,825,000 feet and the soft woods 17,939,799,000 feet. The following table gives the lumber output by States and the number of mills reporting in 1910:

State.	No. of Mills.	Feet.
Alabama .....	1,358	1,465,623,000
Arkansas .....	1,260	1,844,446,000
Florida .....	345	992,091,000
Georgia .....	1,265	1,041,617,000
Kentucky .....	1,660	753,556,000
Louisiana .....	497	3,733,900,000
Maryland .....	431	154,554,000
Mississippi .....	1,061	2,122,205,000
Missouri .....	1,325	501,691,000
North Carolina .....	2,368	1,824,722,000
Oklahoma .....	234	164,663,000
South Carolina .....	693	706,831,000
Tennessee .....	1,774	1,016,475,000
Texas .....	466	1,884,134,000
Virginia .....	2,286	1,652,192,000
West Virginia .....	1,069	1,376,737,000
Total .....	18,092	21,235,437,000

The above figures are exclusive of lath, shingles, cooperage, tanning extract, tanbark, cordwood, pulpwood, wood distillation, hewed railroad ties, fence posts, telegraph and telephone poles, piles and other round and hewed timbers. Statistics for some of these commodities have not been compiled by States, and for that reason figures cannot be given separately and accurately for the South; but if all products coming from the forest were measured and counted, the total would unquestionably show that the forests of the 16 States in the table yield not less than 40,000,000,000 feet, board measure, yearly.

That is an enormous resource which bounteous nature gave the South, and the South is giving it to the nation and to the world. About 150 commercial tree species grow in the South, though some are comparatively scarce and are not now of much importance; but every one of them has been found serviceable for something besides fuel, and has a money value. A Government report published in 1912 on the wood-using industries of Texas listed 119 woods which grow in that State, every one of which was found in use in the State.

The timber of the South belongs in two general classes, hard woods and soft woods. The hard woods are the broad-leaf trees, most of which shed their leaves in the fall. The soft woods are needle-leaf, and only one (cypress) sheds its leaves annually. The two classes grow in mixture to some extent, but generally they are fairly well separated. The great belts of cypress and pines sweep round the coast from Maryland to Texas, and west of the Mississippi extend northward to Missouri. Smaller tracts of pine, spruce and hemlock occupy some of the Appalachian summits and high slopes.

Some of the hard woods extend down to the coast and occupy part of the flat country and the swamps which are not much above tide level; but such is not the South's important hardwood region. It lies on higher ground. It reaches the tops of some of the loftiest summits in West Virginia and of the States southward to Georgia, and it covers the mountain sides and the rolling hills. A belt approximately 300 miles wide crosses east and west the States of Kentucky, Tennessee and the northern portions of Georgia, Alabama and Mississippi, and ends in Arkansas, Texas and Louisiana.

The 16 States listed above supply more than half of the lumber of the United States and it goes to all parts of the country, even to the Pacific coast, which has enormous timber resources of its own. The furniture makers west of the Rocky Mountains buy oak which grows among the mountains south of the Potomac. The vehicle manufacturers of the Pacific slope send 2000 miles to Arkansas, Tennessee and other Southern States for hickory. Ash from the same region reaches numerous factories beyond the Rocky Mountains. However, the principal market for the South's lumber is in the States of the North and East. A Northern factory which does not have its Southern pine, oak and cypress is hard to find. Comparatively few of the Northern States are now producing the lumber they use. They are buying from the South. The prevailing direction of lumber shipments in the region south of the Potomac and the Ohio is northward.

This betrays a condition which, if the South's interest is to be looked after, ought not exist much longer. The South is furnishing the rough lumber, but is not further manufacturing as much of it as it should. Only half of the work is being done in the South that should be done there. The trees are cut and are converted into lumber, which is promptly started on its way to some distant factory to be made into furniture, vehicles, agricultural implements and a score of other commodities which could be manufactured in the South as well as anywhere else, thereby keeping the profit and the wages at home.

Take three typical States, Alabama, Mississippi and Tennessee, and let statistics tell the story of what the South is doing with its lumber:

	Annual sawmill cut. Feet.	Further manu. Feet.	Per cent. fur- ther manu.
Alabama .....	1,691,001,000	726,816,900	43
Mississippi .....	2,572,669,000	443,272,993	17
Tennessee .....	1,223,519,000	413,878,167	34
Total .....	5,487,519,000	1,583,968,060	29

Seventy-one per cent. of the lumber cut by sawmills in these three States is not further manufactured in the States. Some of it is used rough and never passes through machines again; but much of it is sent to distant regions, where it becomes the raw material for wood-using factories. Why cannot Tennessee, Mississippi and Alabama work up this lumber themselves? They have the coal for power, and they have waterpower.

These three States are selected because they are typical. They lie side by side. They have soft woods and hard woods. Test the matter further by taking three others—the next tier west—which also lie in a body and which have hard woods and soft woods. Arkansas, Texas and Louisiana are the States. The figures for them need an explanation, for they are not quite on the same basis as those already given. Texas, Louisiana and Arkansas mills turn out large amounts of lumber, which is passed through planers that simply surface it for the purpose of reducing freight charges on shipments. This was listed with products "further manufactured," and greatly increased those figures, as shown in the following table:

	Annual sawmill cut. Feet.	Further manu. Feet.	Per cent. fur- ther manu.
Arkansas .....	2,111,300,000	1,361,382,000	64
Louisiana .....	3,551,918,000	1,354,954,101	38
Texas .....	2,099,130,000	762,336,112	36
Total .....	7,762,348,000	3,478,672,213	45

If a reasonable amount were subtracted for the planed lumber included in the above, and which was not further manufactured, the ratio of manufactured to unmanufactured would be about what it is in Alabama, Mississippi and Tennessee. That is nearly what figures would show for the whole South; but the exact showing cannot yet be made because statistics of wood manufactures in some of the Southern States are not yet completed.

The meaning of these figures should be seriously thought of. About 30 feet of lumber in every 100 that pass through sawmills in the South is further manufactured in the South. The rest is shipped away, except what is used in the rough at home. What becomes of the rough lumber which is shipped out of the South? It is not possible to trace the carloads separately, but a few figures concerning the wood-using factories in Northern States will give a hint. The sawmills of Massachusetts produce 361,200,000 feet of lumber a year and its wood-using factories demand 549,319,644 feet. The South is supplying a pretty large part of the difference. Illinois produces 170,181,000 feet of lumber a year and its factories demand 1,800,000,000 feet—more than 10 times what its forests yield. The South's rough lumber is converted into finished products in Illinois. Could not the South do it as well, and become a manufacturer and seller instead of seller only? Michigan is still a large producer of lumber; but after the amount required for rough construction is taken out, Michigan has not enough left for its own factories. It buys yearly from the South for the purpose of further manufacture 12,000,000 feet of cypress, 15,000,000 feet of hickory, 22,000,000 feet of short-leaf pine, 23,000,000 feet of yellow poplar, 23,000,000 feet of red gum, 35,000,000 feet of long-leaf pine and about 50,000,000 feet of white and red oak, besides large quantities of other woods.

The South is missing its opportunity in not keeping its lumber at home until it is manufactured into finished products ready for the user. Before the war the cotton was sold raw. It is now found profitable to make cloth of it and sell the cloth. In like manner it will be found profitable to convert the trees into furniture, house finish, boats, boxes, farm implements, musical instruments, woodenware, sash and doors, handles, vehicles, cars, laundry appliances, chairs, sporting and athletic goods, caskets and coffins, toys, pulleys, dowels, brushes and brooms, and the many other articles which are wanted in every market in the country. There is no excuse for shipping lumber 1000 miles to be made into furniture and then buy the furniture back with all the cost of labor and profit, and two freight charges added. Build the factory, make the commodities and let the shipments of finished products be away from, not toward, the South.

Many Southern men say they lack the skilled labor for working wood in an up-to-date way. Factories will draw skilled labor, and if they cannot draw it they can develop it. Such labor is not peculiar to any particular region. It obeys the law of supply and demand the same as any other commodity that is for sale. Create conditions which demand skilled woodworkers and they will soon appear.

The South is rapidly cutting its forests. The demands of the country for 40,000,000,000 feet a year of Southern wood is bound to make an impression. The supply, even at that rate, will hold out a good while, but is not exhaustless. If the manufacture of this wood is to be undertaken, it cannot be indefinitely postponed. A change in policy must occur. Manufacturing must go farther than the production of rough lumber. Skilled, as well as unskilled, labor must be employed, and products should be made ready for the user. By doing this, the forests will not only be worth more while they last, but they will last longer. An end will come to the practice of squandering raw material at a low price and there will be substituted the policy of converting the wood into high-grade, highly finished and high-priced commodities, and the South will be the gainer from the first to the last step of the process.

In order that forests may be valuable from the manufacturer's viewpoint, they must contain a variety of woods. An abundance of one or two species only will not suffice. The South fortunately possesses an abundance of both hard woods and soft woods, and a variety of each kind; and they are not confined to any one section, but grow from the Potomac to the Rio Grande. There are pine belts, cypress swamps and hardwood regions, but they are so situated



in regard to one another that a manufacturer in nearly any part can draw the supplies he needs without long hauls or excessive rates.

There has been a great deal said in recent years concerning the exhaustion of the timber supply. Prophets have predicted that the period of depletion is near, and others have set it a little farther off, but none are inclined to extend the time indefinitely. One encouraging development in the situation is that the present-day prophets are not placing the exhaustion of forests much nearer than those who published their predictions 10 years ago. There has been a lot of timber cut in the country in the past 10 years. Counting fuel, cross-ties, lumber and all, the total taken from the woods of the whole country in that time has not fallen below and perhaps has considerably exceeded 750,000,000 feet. Still, no one now holds that the end is immediately at hand, but it still lies somewhere in the indefinite future. The reason that prophets are so willing to revise their predictions and extend the day of grace is that they are becoming better posted in regard to what the country really has. Benjamin Franklin sounded an alarm in 1749 in "Poor Richard's Almanac." He warned his readers that forest exhaustion was at hand, but he did not content himself in foretelling the calamities that would follow. He advocated tree planting as a remedy and in his discussion of that subject he showed a knowledge of practical forestry which does not stand in need of much revision by the best foresters of the present day. But Franklin was wrong in one particular. Forest resources were not approaching exhaustion in 1749. Though he was a wise and a practical man, it did not occur to him that timber 10 miles or more from the settlements could count for anything. What he looked upon as forest depletion was only that part of the forest which lay in and about the settlements at that time, particularly in Eastern Pennsylvania and New Jersey.

There was another scare in 1795. A committee was appointed in New York to take steps to plant old fields with white oak. The country at that time was exporting about 50,000,000 staves a year and other forest products also; and it was declared that America's timber resources were nearing exhaustion. America is exporting 50,000,000 staves annually yet, and there are still some oak and other timber.

A. F. Michaux, a French dendrologist, who traveled through this country more than a century ago, and who visited many parts of the South, was free with predictions that the end of certain timber resources was at hand. He knew the forests well, but seemed unable to grasp the enormous resources which had not then been touched. Other prophets at different times, from 150 years ago till the present, have proclaimed woe to the inhabitants of earth because the end of our forest resources was in sight. Long before the Civil War it was quite generally believed that short-leaf or North Carolina pine (*pinus echinata*) was done for. That opinion was based on the same kind of evidence which had deceived Franklin, the New York committee of 1795 and Michaux. The supply in a certain restricted locality was running low and that was taken to mean that the whole country was depleted.

These references to the unfounded predictions of certain prophets of the past are not meant to confuse the real facts or make light of the true situation. The forests of the United States are being cut faster than they are growing. There are no unexplored tracts of timber to be drawn upon, as there were 50 or 100 years ago. All is now in sight and the total quantity can be figured within a few hundred billion feet. The yearly demand is known and the problem of figuring how long the supply will last at the present rate involves a simple sum in division. The dividend is the total quantity in the woods, the divisor is the yearly cut, the quotient is the years the supply will last. The factor of annual growth is usually thrown in for good measure; but that is exactly the factor in which lies the country's hope and particularly the South's hope. It should not be dismissed as of little value in any calculation, for it is "the stone rejected of the builders," and it will become "chief of the corner."

When Paul Jones' sails, yards, ropes and masts had been shot away, he announced that he was just getting ready to fight. The South should attack its forest problem in that spirit. Paul Jones won out and so will the South. There are wide tracts from Albemarle Sound to Corpus Christi from which the pine forests have been stripped. The hard woods have been cut from thousands of slopes and valleys from Harper's Ferry to Little Rock. The region as a whole does not contain more than half—probably much less than half—as much timber as once grew there. The stripping process has gone about as far as it had gone with Paul Jones when he got ready to fight.

In Beverley's history of Virginia, written 200 years ago, he touched on the problem of natural resources and used these words: "Wood grows at every man's door so fast that after it has been cut down it will in seven years' time grow up again from seed to substantial firewood, and in 18 or 20 years it will come to be very good board timber." Beverley's observation was correct. He doubtless spoke of loblolly pine (*pinus taeda*). The growth of that timber in the South is one of the wonders of the world. The earliest lumber operations in the United States began in Virginia more than 300 years ago with the cutting of red cedar and sassafras. It has gone on until the present time, and after three centuries of forest cutting the United States census shows that in 1909 Virginia had more sawmills than any other State in the Union.

Not one tree in 1000 of those which went to Virginia's sawmills in 1909 was in existence when lumbering began 300 years ago. It has all grown since that time. Of all the yellow pine now going to sawmills in Virginia, hardly one tree in 50 is 100 years old. The trees of the mountain forests average older. We have in this one State the spectacle of 3600 sawmills at work on timber which has grown, if not within the memory of living men, at least very recently as historical time is measured.

All other Southern States can do nearly as well as Virginia has done in growing timber. The principle difference between conditions in Virginia and in some of the other parts of the South, as the traveler observes them in

passing through, is that Virginia is not so eternally devastated by forest fires as some of the other States are. Seedling trees have more chance there than in Alabama, Mississippi, Louisiana, Texas and Arkansas, where an unfortunate sentiment seems to prevail that one crop of timber is all that the Creator of the universe intended that the sons of men should ever cut from a piece of land. Consequently, the annual fire and the razor-back hog are left unhindered to do their worst with the young trees which try to grow when the old ones have been cut. A different policy would insure, or would have insured, a stand of trees on every acre of the South from which timber was cut and which land was not wanted for agricultural purposes. In too many instances the time has now passed when the cutover lands will reforest naturally. The seed trees, the seedlings and the seeds are gone. Such tracts must be artificially planted, or they will never again have a forest. In thousands of instances it will pay to do that.

The long-leaf pine (*pinus palustris*) is in more real danger of extermination than any other important timber tree of the United States. It is a noble specimen of the vegetable kingdom; but, like the Indian who is a noble specimen of the animal kingdom, it seems unable to thrive among civilized surroundings. Few seedlings are coming on and the primeval stands are disappearing. Its power of reproduction under its changed surroundings is low. The writer during the past two years has traveled through every Southern State, visiting almost every county in some of the States, and everywhere with scarcely an exception worthy of mention it was observed that long-leaf pine is passing away to come no more. Short-leaf, loblolly and Cuban pine (*pinus heterophylla*) promise more. They hold their ground if given half a chance, and are perfect missionaries to push into new lands. All things considered, the loblolly pine seems to be the coming great soft wood of the South. Its vigor in reproduction, rapidity of growth, large yield per acre and the general high quality of its wood make it a species on which the lumberman of the future can pin his hope.

An acre of vigorous pine ought to produce 300 feet of lumber a year and the South has 40,000,000 or 50,000,000 acres of such land, without appropriating any that ought to be devoted to agricultural purposes. At that rate the yearly yield for all future time would be 12,000,000,000 feet of lumber. That is considerably less than the present annual soft woods' production of the South, which is about 14,000,000,000 feet; but it would be a vast resource, especially when the time comes in the comparatively near future when Southern pine will be worth \$25 or \$30 at the mill, instead of \$12.69 a thousand, as it was reported in 1909 by the Federal census.

The production of naval stores has long been a great industry in the South and may continue to be, though if carried on as in the past it cannot continue indefinitely. It has led to the destruction of enormous forests of long-leaf pine by excessive boxing and carelessness with fire. Too frequently in the past it was the custom to consider turpentine the chief crop and lumber of minor importance. That view cannot now be taken, though turpentine's value is great. The South's annual turpentine crop is now worth about one-sixteenth as much as the output of its sawmills.

It is possible to maintain the turpentine industry at high figures by methods less destructive than those which have usually prevailed in past years in the Southern long-leaf pine belt. Mr. S. J. Holmes, State forester of North Carolina, recently visited France and published a report on turpentine methods there, by which the trees live and produce resin until the time comes to cut them for lumber. They are then purposely bled to death. Mr. Holmes believes that the South's naval stores' industry can be perpetuated and kept profitable in the same manner. In fact, much has already been done in that direction. The destructive boxing which weakens trees and makes them a prey to wind and fire is giving place to the cup, gutter and apron methods of extracting resin and saving the trees.

The annual production of hard woods in the South does not exceed one-third that of soft wood. The conditions prevailing in the hardwood regions do not differ greatly from those among the pines. Cutting without thought of the years to come is the rule; and fire does its work later. Hard woods differ in one essential particular from soft woods, and that difference favors them in the struggle against destructive agencies. Hard woods produce sprout growth, soft woods (with few exceptions) do not. The hard woods are consequently more difficult to kill, and with a little encouragement the forests will renew themselves. However, there is no species of tree or shrub that can survive repeated and long-continued visitations from fire; and some of the hardwood districts of the Appalachian region have been paid regular visits for a long time.

Good hardwood growth, like that in the Southern Appalachian Mountains, will easily produce 300 feet of wood, board measure, per acre per year. An area of 20,000,000 acres kept perpetually in such forest will yield annually more lumber than the present cut of hard woods in all the Southern States. The ragged remnants of the hardwood forests are now going to Southern sawmills at the rate of about 4,000,000,000 feet a year. Care of what is left—and that care will consist principally of measures to keep fires out—will insure a perpetual yield as large as the present, or larger.

The timber harvest of both soft and hard woods can be made as regular and as dependable as the harvest of corn or cotton; but to reach that desirable result methods at least as scientific must be adopted. The man who would depend on volunteer crops of cotton and corn would be conducting his business as intelligently as the man who cuts one crop of timber and depends upon uncared for volunteer growth to supply his future wants. Nature gave freely the first great timber crop to the South, but much of that crop has been gathered and nature will not give another like it unless men develop an ability and willingness to help.

# The Potentialities of Southern Agriculture

By J. F. MERRY, Manchester, Iowa.



HE South: the Nation's Greatest Asset, is a broad but plain statement of facts that needs no verification to those who are familiar with Southern conditions. Fortunately, however, the Manufacturers Record is read by manufacturers, bankers, land investors and farmers located north of Mason and Dixon's Line, who otherwise might have had no special reason for investigating Southern conditions. Living in a prosperous section of the nation, they may, before reading the testimony to be found in the Manufacturers Record, have questioned the use of the word greatest in the assertion that the South is the nation's greatest asset. And possibly some aggressive Iowa farmer living in a State that produced 421,000,000 bushels of corn last year may conclude that as the South has but 16 of the 48 States in the nation, he can group a like number of Northwestern States and make a showing of assets at least the equal of the Southern States. The Iowa farmer is honest in his convictions, but on investigation he will find that the great Northwestern States excel only in food products, while the Southern States, from their great variety of grains, fruits and vegetables, can feed, from their fleecy cotton can clothe, and from their pine forests can house the people of the nation. That particular class of Southern assets which I am to discuss concerns agricultural conditions only. I am, therefore, especially anxious that without prejudice my friends of the North shall carefully consider the possibilities of Southern agriculture as enumerated in this article.

The accompanying table, reproduced from the thirtieth anniversary issue of the Manufacturers Record, shows that the total acreage of the 16 Southern States is 604,817,920. Of this acreage 384,117,000 is farm land, 258,700,000 wood land and 53,114,500 wet land. Farm lands of the South constitute about 44 per cent. of the total farm lands of the United States. A large part of the 258,700,000 acres of wood land, when cleared, is susceptible of cultivation. Nearly 75 per cent. of the 74,541,700 acres of wet lands in the United States are in the South. One can hardly conceive of the immense value to the South the development of the wood lands and the wet lands of that territory will be. What marvelous agricultural possibilities lie dormant in the more than 300,000,000 acres of wood and wet lands of the Southern States! The writer has recently visited the pine-timber lands and the overflow lands of Mississippi and Louisiana. We have noted how in the past 25 years a single parish in Louisiana has developed from a pine forest into an agricultural paradise where thousands of farmers are now engaged in the growing of strawberries and vegetables for early Northern markets, and where whole trainloads of berries are shipped from a single station that 25 years ago was but a short siding in the pine woods. It is estimated that over 10,000 acres of strawberries were grown in that parish last season, the money returns from which are too fabulous to be believed. Great quantities of milk are also produced in this parish and shipped to New Orleans. I refer to this as a specific case of what is actually being done on cut-over pine lands in the Southern States. For what is being done in Louisiana is now being done or will be done in the near future in every one of them.

It should not be difficult for the most skeptical to see the possibilities of Southern agriculture when they consider that the South yet has over 250,000,000 acres of undeveloped wood lands. In this connection it is worth while to consider the present value of the lumber products that come from these lands. Forty, fifty, sixty years

ago, when the pioneers of Ohio, Michigan and Indiana undertook to clear their splendid forests, it was as discouraging as it was hard, for the reason that timber products at that time had little or no value. The trees were simply felled and piled and burned. Not so in the South today. On every line of railroad through the pine forests, every three to five miles, may be seen portable or immense stationary sawmills running on full time, and often overtime, that orders may be filled, not for home consumption, but in many cases to accommodate the urgent demand of dealers throughout the East, Middle West and Northwest. The splendid white houses and red barns of Illinois and Iowa were constructed from Southern pine lumber, millions of feet of which is now finding its way North, not in occasional car lots as formerly, but in trainload after trainload, and at prices that make the Southern lumber men smile and the Southern farmer to rejoice, for he realizes that soon his cut-over land will increase his acreage for the plow. We learned only recently of a truck farmer in Louisiana who last season netted from his crops grown on cut-over pine

lands over \$200 per acre. It would hardly be safe to estimate the value of products at \$200 per acre that may be grown on the South's 250,000,000 acres of wood land or even one-hundredth part of the amount when cleared and in cultivation. This may be said, however, that these figures show the immeasurable agricultural potentialities of the South.

The more than 50,000,000 acres of wet lands in the 16 Southern States must certainly be counted as among the nation's greatest assets, and with agricultural possibilities that cannot be overestimated. Perhaps the most striking way to present the agricultural potentialities of the South's wet lands is to compare them with Holland, which is known as a country of "Dutch diked farms" that are now worth from \$500 to \$1500 per acre. It was a great undertaking to construct levees sufficiently high and strong to protect lands that were 15 feet below the sea level, but the Hollanders were equal to the emergency. They not only needed to exercise great skill in protecting the drained lands from inundation, but the land itself required a great amount of fertilizer and the most thorough cultivation.

Not so with the reclaimed lands of the South. When once drained they are dry, mellow and fertile. For years no fertilization will be necessary, and no fears need be entertained as to overflows or to an excess of water, except perhaps at certain seasons of the year from natural rainfall. Mr. Perilliot, a noted engineer, in writing of Holland, says:

"The land of Holland, covering about 12,700 square miles of area, is susceptible for nearly two-thirds of this to overflows, either from the sea or from the rivers Rhine and Maas during their high states, the lower parts of the Rhine being given in Holland the names of Waal, Lek and Yssel. The western and central northern part of Holland is generally below sea level, in some instances as much as 15 feet, notably in the locality known as the Haarlem-Mermeer polder. This stretch of country below the sea level is separated from the sea by the sand dunes or natural sand levees, which are from 30 to 60 feet high, and have been built up in the course of ages by the action of ocean waves and by the winds. These dunes, however, are not continuous, and in some instances have been breached by the sea, rendering possible the overflow of the lands below sea level had not these breaches been closed by sea dikes or levees. At the present time all of these lands, which vary from sea level down to a depression of 15 feet below sea level, are surrounded

## SOUTHERN AGRICULTURAL PROGRESS.

### CAPITAL INVESTED IN FARMS.\*

	The South.	United States.
1880.....	\$2,762,077,000	\$12,104,002,000
1890.....	\$3,923,560,000	\$15,982,268,000
1900.....	\$5,262,279,000	\$20,514,002,000
1910.....	\$10,961,865,000	\$40,991,000,000

\*Value of lands and improvements, implements and live-stock.

### VALUE OF AGRICULTURAL PRODUCTS.†

	The South.	United States.
1880.....	\$756,043,000	\$2,212,541,000
1890.....	\$876,452,000	\$2,460,107,000
1900.....	\$1,564,069,000	\$4,717,070,000
1910.....	\$3,085,000,000	\$8,694,000,000

†In 1880 and 1890, not including animals slaughtered on farms or sold.

### INCREASES.

#### CAPITAL INVESTED.

	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890..	\$1,161,483,000	42.	\$3,878,266,000	32.
1890-1900..	\$1,338,719,000	34.1	\$4,531,734,000	28.3
1900-1910..	\$5,699,586,000	108.3	\$20,476,998,000	99.8

#### VALUE OF PRODUCTS.

	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890..	\$120,409,000	15.9	\$247,566,000	11.2
1890-1900..	\$687,617,000	79.6	\$2,256,963,000	91.7
1900-1910..	\$1,520,931,000	97.2	\$3,976,930,000	84.3

## DIVISIONS OF AREA IN ACRES IN 1910.

States.	Total.	Farm Land.	Wood Land.*	Wet Land.*
Alabama.....	32,818,560	20,713,000	20,000,000	1,120,000
Arkansas.....	33,616,000	17,377,000	24,200,000	5,760,000
Florida.....	35,111,040	5,231,600	20,000,000	18,560,000
Georgia.....	37,584,000	26,866,000	22,300,000	2,400,000
Kentucky.....	25,715,840	22,159,000	10,000,000	224,000
Louisiana.....	29,061,760	10,519,000	16,500,000	9,600,000
Maryland.....	6,362,240	5,051,600	2,200,000	356,000
Mississippi....	29,671,680	18,419,000	17,500,000	6,173,000
Missouri.....	43,985,280	34,516,600	18,300,000	1,920,000
N. Carolina....	31,193,600	22,400,000	19,600,000	2,400,000
Oklahoma.....	44,424,960	28,717,000	8,000,000	35,000
S. Carolina....	19,516,800	13,469,000	12,000,000	1,760,000
Tennessee.....	26,679,680	20,011,000	15,000,000	800,000
Texas.....	167,934,720	109,226,000	30,000,000	1,620,000
Virginia.....	25,767,680	19,476,000	14,000,000	384,000
W. Virginia....	15,374,080	9,961,000	9,100,000	2,500

Total..... 604,817,920 384,117,000 258,700,000 53,114,500  
United States.. 1,903,461,760 873,729,000 544,250,000 74,541,700

\*1908.



and protected either by the natural sand dunes or by the artificially-built sea dikes. This describes in general terms that part of Holland which has been wrested by the people from the sea to provide habitation for the thrifty Dutch."

In the Manufacturers Record of September 12 appeared a most interesting article from the pen of Mr. Ira H. Shoemaker, who had just returned from a trip through Holland. He describes the principal channels of travel as waterways or canals, and states that there are thousands upon thousands of Holstein cattle that are maintained the year round on one acre per cow, showing that Hollanders practice intensive farming. Holland now has a population of 6,000,000—an average of 500 inhabitants to the square mile. Think of the



AN ALABAMA CORNFIELD.

farming districts of the South when they shall have a population of 500 to every section of land, and yet we are told that not even the Valley of the Nile is comparable in fertility with many of the wet lands of the South. Does anyone question the reclamation of these lands, let him visit Louisiana or the Everglades of Florida. Several gentlemen who are interested in reclaiming a few thousand of the 9,000,000 acres of wet lands in Louisiana, on a recent visit to New Orleans, told me that the experimental stage of reclaiming wet lands in the South has been passed; that it is now only a question of time when these lands will be sought after by agriculturists who are familiar with intensive farming and who are willing to pay for lands not to exceed 25 per cent. of the prices in Holland at the present time. It is a significant fact that a very large percentage of our wet land in the South is contiguous to large cities, and this greatly adds to their intrinsic value.

Another feature of Southern agriculture that we fear is often overlooked even by Southern farmers is the climatic conditions that permit the growing of two, and in many cases three, crops per year on the same ground. Farmers of the West and Northwest are very well satisfied if the season is sufficiently long to mature well even one crop. Indeed, the practical farmer operating in the great corn State of Iowa is careful to plant only such seed as will grow and ripen within 100 days. In the South corn is ready to harvest before it is knee high in the Northwest. We do not urge that three consecutive crops should be grown each year even in the South, but that such may be the case is but another indication of the possibilities of Southern agriculture. Except, perhaps, in the western portion of Texas and possibly a small area of Oklahoma, and the rice districts of Louisiana and the Carolinas, irrigation is wholly unnecessary in the South, thus eliminating from farming operations quite an expense and not a little labor and care. The annual rainfall of the South averages around 50 inches and is ample for the production of crops grown in a semi-tropical country.

Having considered in a general way a few of the things that combine to make the Southern States great in agricultural potentialities, let us now investigate one by one several of the farm products successfully and profitably grown in the South.

#### COTTON PRODUCTION.

Occasionally we see it stated in some of our Southern papers that cotton is no longer king; that he has been dethroned by corn or some other staple crop. This is a mistake. The South is his domain, and he has not been, nor is he likely to be, dethroned. Indeed, his future supremacy never had so good an

outlook as now. It is one of three, and the principal, staple crop of the nation that can be grown to any extent only in the Southern States, it is the one product in use by all peoples of all ages from the cradle to old age, and there is no likelihood that it will ever be supplanted by any other article of commerce. Col. Henry G. Hester, who is serving his forty-third time as secretary of the New Orleans Cotton Exchange, gave me the cotton statistics to be used in this article. From him we learned that the world's cotton crop for 1911-1912 was 24,968,000 bales. Of this crop the United States of America produced 16,138,000 bales, India 4,078,000, Egypt 965,000, and the balance of the world 3,797,000 bales. Judging from this showing, it would seem that a section of country that last season produced nearly 70 per cent. of the world's cotton has a right to assume that this one great crop, which may be largely increased, should be reckoned among the strong potentialities of Southern agriculture. Another feature of the cotton industry is the fact that the mills of the Southern States now consume more than half the raw American cotton consumed in this country. Such has not always been the case. In 1890 Northern mills used 1,799,258 bales of our cotton, while Southern mills used but 546,894 bales, or less than one-third the amount consumed by Northern mills. In 1912 Northern mills took 2,631,432 bales, while our mills in the South used 2,744,067 bales. These conditions indicate the establishment of many cotton mills in the South, employing hundreds of thousands of operators who must be fed from the products of the farm, thus creating a demand for more acres in cultivation adjacent to manufacturing centers and emphasizing again the possibilities of Southern agriculture. There were 628,252 spindles and 11,221 looms added to Southern mill equipment last year, and others are in contemplation for the year 1913. Cotton may be grown in all of the 16 Southern States, but the crop of 1911-1912 was grown as follows:

	Bales.
Alabama.....	1,738,000
Arkansas.....	941,000
Florida.....	95,000
Georgia.....	2,878,000
Louisiana.....	403,000
Oklahoma.....	1,036,000
Mississippi.....	1,221,000
North Carolina*.....	1,194,000
South Carolina.....	1,732,000
Tennessee†.....	573,000
Texas.....	4,327,000
Total crop.....	16,138,000

\*Including Kentucky and Virginia.

†Including Missouri, Arizona, California, Kansas and New Mexico.

Colonel Hester made the statement that should the crop of cotton in the United States within the next five or six years reach 20,000,000 bales annually it will all be needed to supply the world's demand. This statement from such an authentic source should convince our farmers of the South that cotton may be grown without fear of overproduction. Our contention is that lands adapted to cotton growing should be used for that purpose.

Some years ago the writer, while engaged in trying to settle up the Southern farm lands adjacent to the Illinois Central Railroad, received a letter from a gentleman from Indiana advising that he had purchased a farm and would soon settle in Mississippi. Voluntarily he made the statement that he should not "tackle cotton," as he expressed it, but would continue to grow crops with which he was familiar. We felt constrained to write him that, inasmuch as cotton was a staple crop to which a part of his farm was especially adapted, we would suggest he experiment with 20 acres in cotton. Proffered advice is not usually heeded, and we had little hope that it would be in this case. During the late fall, however, we received a second letter from the gentleman in which he stated that, taking my advice, and to satisfy his boys, he planted 20



PART OF THE COTTON HARVEST.

acres in cotton; thoroughly prepared the seed bed; was careful in the selection of seed cotton; cultivated it well, and he and two boys did all the work, except in picking time when he hired a few children. But the feature of his letter that interested me was the statement that as a result of their efforts in growing 20 acres of cotton 22 bales were now stored in their own shed to be sold when they got ready.

Let me say to homeseekers from the North who locate in the cotton-producing States of the South: Throw aside your prejudice against cotton and make it one of your principal crops. If the present demand consumes all the cotton grown in the United States, what will be the result when the Panama



EARLY TOMATOES.

Canal is open to commerce? I think the Southern States will be first to demonstrate the practicability of this great interoceanic waterway. Over 400,000,000 of the yellow races of the Orient use wearing apparel made from cotton. This material the Southern mills can furnish in quantities that will supply the demand for millions of shirts and baggy trousers so popular in those countries. China is already one of our best customers for cotton goods. The opening of the Oriental markets for Southern products will add immensely to the possibilities of Southern agriculture. Colonel Hester also advised that so great has been the demand the cotton of the South marketed during the past three years has already been consumed with the exception of about 450,000 bales. Our farmers and planters of the South, while always producing a diversity of crops, should never lose sight of the fact that cotton is one of the nation's greatest assets, having a value this year of nearly or quite \$1,000,000,000. If Iowa could grow cotton as does Texas, her prairies at picking time would resemble her snow-covered fields in winter. But she can't do it. Only the South is thus favored.

#### SOUTHERN CORN PRODUCTION.

From the earliest history of the South its every State could and did produce corn. In 1860 its corn crop was 431,000,000 bushels—52 per cent. of all the corn grown in this country. Travelers note the manner in which much of the corn in the South is now cultivated; how the seed bed is prepared and the careless manner in which the seed is selected, often being taken from the shed or crib and planted without any regard to what percentage of it will grow. We can only be surprised that the yield is what it is. In 1912 the corn crop of the United States was 3,169,137,000 bushels, while that of the South was 1,135,939,000 bushels, and that the 16 Southern States, with their crude methods, should have produced 36 per cent. of the nation's crop is but another illustration of the possibilities of Southern agriculture. Only a few years since and the average production of corn in the South was 13 to 15 bushels per acre. These conditions, however, could not long remain. Everyone familiar with Southern agriculture knew that corn could be successfully grown in the South; that the soil, climatic conditions, rainfall and the long seasons made it an ideal territory in which to grow this crop under normal corn-producing conditions.

Among the men to whom the South is indebted for introducing better corn-growing methods in the South are Hon. James Wilson, Secretary of Agriculture, Washington, D. C.; the late Dr. Seaman A. Knapp of Lake Charles, La., and Prof. P. G. Holden, at that time connected with the Agricultural College at Ames, Iowa. It is something of which Iowa is proud that all three of these grand men have at some time been connected with the Iowa Agricultural College, and to some of us at least it is especially gratifying to know how these men are appreciated throughout the South. Dr. Knapp was one of the founders of the Boys' Corn Clubs in the South, and what these clubs have already done in increasing the corn yield of that territory is most remarkable. Among the first, if not the first, State to introduce such clubs in the South was Mississippi. In 1910 60 counties in that State organized Boys' Corn Clubs, 40 of which reported to the Agricultural Commissioner of the State. A study of these reports is most interesting, as they not only show what can be done in Mississippi, but what may be done by such clubs throughout the South, as reports from each State are quite similar. One boy in Marion county, Mississippi, produced 229.93 bushels of corn on a single acre. Another from Covington county, 192 bushels. Forty Mississippi boys produced over 100 bushels per



A FLORIDA WINTER GARDEN.

acre each on land that had averaged under old methods from 15 to 25 bushels per acre. Of all these reports from hundreds of boys from corn grown on all classes of soil and under all conditions the lowest yield was 68 bushels per acre. The boys were required to keep an accurate account of the cost of production. Such expense accounts vary as a matter of course, but one boy produced 212 bushels of corn from one acre at a cost of only eight and one-half cents per bushel. At the Piper City (Ill.) County Fair the sweepstakes prize for corn over all competitors was awarded to a gentleman from Warren county, Mississippi. That same year 25 boys in Louisiana produced over 100 bushels per acre each. In 1911 one gentleman from Alabama produced a yield of 237 bushels per acre. It would be interesting to know the effect of these experiments on the average yield per acre in the States where the experiments have been made. The writer recently propounded this question to some gentlemen he chanced to meet in Mississippi and Louisiana. None of them could speak with authority, but they assured me that it had not only been the means of increasing the average yield from five to ten bushels per acre, but it had stimulated the planting of more corn, and the crop had so increased that thousands of bushels of corn are now annually exported through New Orleans from these States. On inquiry as to the shipping qualities of Southern corn, we learned from one engaged in the business that corn matured in the South shipped even better than that grown in the Northern States. We are not especially proud of having corn exported from the South, and we are quite sure the time is near at hand when the Southern crop will be converted into beef and pork and will prove to be one of the greatest possibilities of Southern agriculture. Corn is destined to become another billion-dollar crop of the South. Referring again to the enormous yields of corn as shown by the boys' reports, and the liberal use of fertilizer and the unusual cultivation that was given each acre, we ventured to suggest to a Southern farmer that the results of these experiments were very gratifying. His reply was: "I call it extravagant farming, sir." Possibly so, but if true, then the South needs, and will in the future have, more of such extravagant farming. The soil, sunshine, rain and long seasons are natural conditions for the growing of corn that could not be improved upon, and if the annual yield of corn in the South is not 40 to 50 bushels per acre, instead of 15 to 30, it is the fault of the grower and not because of unnatural corn conditions.

#### SOUTHERN SUGAR CANE.

For more than half a century Louisiana cane sugar has been used upon American tables and in American kitchens. Some of us remember when attending the district school more than 50 years ago that as it came to the noon hour we were delighted to find in the little old dinner basket a slice of bread and butter on which Mother had spread a thin coating of Louisiana sugar. It was not white as now, but, "oh, my! it was good." While reading the morning papers a few weeks since we heard a conversation over the phone between Mrs. Merry and her grocer. In her order for supplies, among other articles was the item of granulated cane sugar, and lest some other kind should be furnished she twice repeated that none other than cane sugar be sent. This thought came to us in contemplation of what we had heard in this conversation. If the housewives and cooks of the nation still insist that cane sugar is so superior in quality that they will use none other, there is little danger that the sugar-cane industry will cease to be one of the prominent potentialities of Louisiana and Texas. Our tariff reformers will aim to do the right thing, but every member of Congress, no matter in what part of the

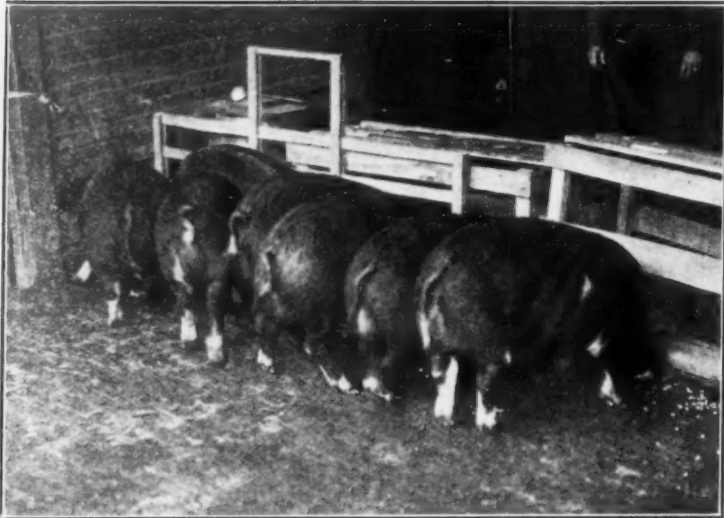


A STRETCH OF CAULIFLOWER.



CABBAGES.





RAISING THE GRADE OF PIGS.



PEDIGREED SOUTHDOWNS.

nation he may reside, was "brought up" on Louisiana cane sugar, and it will not be easy nor pleasant for him to take any action that will place Louisiana and Texas sugar growers in competition with Cuba and Central America to such an extent that our sugar supply can no longer come from New Orleans. The lands of Louisiana and Texas upon which sugar cane is grown are the best in this country. They will produce any product grown in a semi-tropical climate, and we are not sure but that crops other than cane can be grown upon these lands more profitably than sugar cane. We are, therefore, not pleading so much for the cane growers of Louisiana as we are for the American people. The best is none too good. We are a prosperous nation, and if Louisiana sugar is the best in the world, we will sweeten our Southern grapefruit, oranges and strawberries with none other. We believe this sentiment to be quite general throughout the nation, and so long as it continues the growing of sugar cane will continue to be one of the South's prominent and profitable industries. We saw the statement only recently that when all the lands of Louisiana adapted to sugar cane were in cultivation it could produce every pound of sugar consumed in the United States. This would indicate that sugar-cane growing may continue to be one of the strong potentialities of the South.

#### SOUTHERN RICE CROP.

Rice is another farm product grown almost exclusively in the Southern States. No farther back than 1880 the Carolinas, Georgia and Florida produced 77 per cent. of the rice grown in this country, but with the development of Arkansas, Western Louisiana and Texas a great change has come over the rice-producing sections of the South. The crop of 1912 was estimated at 25,000,000 bushels, 11,800,000 bushels of which were grown in Louisiana, 9,400,000 bushels in Texas and 3,400,000 in Arkansas. Thirty years ago but few acres of rice were grown in Louisiana, and that in the crudest possible way. When the prairies of Calcasieu parish began to settle up with Northern farmers and experimentations with different farm crops was inaugurated, it was soon discovered that the soil was adapted to the growing of rice, and that by the use of deep wells and pumping stations the rice fields could be overflowed, making it an ideal country for the production of rice as a commercial crop. Large fields were at once prepared for the growing of rice. Large rice mills were erected at several of the important railway stations, and already this comparatively new industry has assumed proportions of national importance. Texas has also fallen in line, and thousands of acres of its prairie lands are now cultivated in rice. The same may be said of Arkansas. Twenty years

ago no one thought of Arkansas as a rice-producing State, but it has already been demonstrated that nowhere can rice be produced at less expense or of a better quality than in Arkansas. Several other Southern States are growing rice in a small way. In fact, the rice crop, now valued at about \$25,000,000 annually, is another staple crop of which the South has a monopoly and which may be doubled or quadrupled if the demand should warrant it.

The rice production of the United States has within the past 10 years equaled that of the preceding 50 years, and the outlook for the further extension of rice culture is very promising. It is estimated that five of the Southern States bordering on the Gulf of Mexico have 10,000,000 acres especially adapted to rice culture, but hardly 3,000,000 acres can be easily irrigated. There are now about 175 canals and pumping stations in operation in Louisiana and Texas. In 1911 there were 76 mills in the South in use for the cleaning and polishing of rice. In 1910 the Southern States exported to foreign countries 7,049,597 pounds of domestic rice; 70,000 pounds to Hawaii, 117,527,267 pounds to Porto Rico—a total of 124,676,865 pounds, valued at \$3,972,059. The opening of the Panama Canal will give the South a market for its rice in countries where it is now and has been for centuries a principal article of diet.

#### SOUTHERN WHEAT AND OATS.

In 1912 the United States produced 720,333,000 bushels of wheat. The South has for years grown more or less of this staple product, but has never been regarded especially as a wheat country, although in 1912 it produced 98,080,000 bushels, or nearly one-seventh of the nation's crop for that year. Only two of the 16 Southern States do not attempt to grow wheat commercially, and for the reason that other crops are more profitable. That the wheat crop of the South may be and will be materially increased should it appear profitable there is no question of doubt, but it shows good judgment on the part of Southern farmers to grow the products for which their lands and climatic conditions are adapted and of which they have a monopoly. Minnesota and the Dakotas can grow the wheat, but only the Southern States can grow the cotton and cane. The very fact, however, that the South last year produced wheat to the value of \$100,000,000 entitles it to a place among the possibilities of Southern agriculture. When the thousands of acres of unimproved wheat lands of the South are developed, as they are sure to be, then the acreage of wheat may be doubled. The oat crop in the South last year was but 137,865,000 bushels. It might have been and should have been several times that amount. No better grain is grown for horses and mules, and



CATTLE RAISED NEAR JACKSON, MISS.



A GEORGIA PEACH ORCHARD IN BLOSSOM.

when ground with corn and barley is a most excellent food for cattle and hogs. Some years since a farmer from Iowa settled on an old plantation in the South. In October he plowed quite an acreage of his land, using four horses and plowing to a depth of 10 inches. After his field had been thoroughly harrowed he started his drill, filled with winter rustproof oats. A neighbor, who was an old-time resident, thought to do him a kindness by advising that to sow oats in that country was a waste of time and money, as he would never get even his seed back on account of rust. The Western farmer was not to be dissuaded from his purpose, and finished drilling in his oats. During the following May he harvested a fine crop of oats and sold them for 75 cents per bushel. The following year many of the neighbors sowed winter oats, and the industry extended until it required four threshing machines to thresh the oats grown in that county. One of the noticeable results of growing such crops of oats is now seen in the fat, sleek horses and mules of that territory.

#### SOUTHERN ALFALFA.

Alfalfa is the king of all forage plants, but it stubbornly refuses to grow except under the best possible conditions. It is not, however, confined to localities, nor is it particular as to the color of the soil. But it will not grow on land that is not thoroughly drained, nor in soil that has been robbed of its humus, nor does it thrive except in well-prepared seed beds. Its demands, however, are in keeping with the character of the plant. It is the "best ever," and it, therefore, insists on the best preparation, fertilization and cultivation. It seems strange that so excellent and so important a forage crop as alfalfa was never discovered as adapted to the United States until a few years since, when Western Nebraska, Colorado and California proved its great value in sections where there was little rainfall. The South, with its Bermuda and lespedeza, with its cowpeas and corn, gave little attention to this Western crop, of which so much was being written, until it was ascertained that alfalfa was not only a great forage plant, but an excellent restorer of the soil. Then our Southern friends became interested and experiments on a small scale were begun in many of the Southern States. Not, however, until a gentleman from Mississippi carried off the gold medal prize for the best exhibit of alfalfa at the St. Louis Exposition in 1904 did the South wake up to the possibilities of a new farm product. This achievement at the St. Louis Exposition is so interesting and of such great value to the entire South that we invited the gentleman who won the prize to tell us all about it, which he has kindly done in the following letter:

"West Point, Miss., November 13, 1912.

"Capt. J. F. Merry,

Manchester, Iowa.

"Dear Sir—In your letter of the 8th inst. you asked me for my experience in the last 10 years with alfalfa on the black prairies of East Mississippi, which I am glad to give and hope it will be interesting. In the summer of 1902 I had the pleasure of spending a day at the University of Illinois, being entertained by Dr. Cyril G. Hopkins, chief of agronomy and chemistry, who is authority on soils. In looking over his experimental fields the doctor pointed out to me a small field of alfalfa that he said was growing in perfection. The doctor was very proud of this plot of grass, and called my attention to its wonderful value as a forage plant, explaining its longevity of life, its wonderful production and its great ability to fertilize the soil. I secured 100 pounds of inoculated soil from this plot. Under the directions of the doctor, I planted one-half acre on my plantation in East Mississippi in alfalfa in the spring of 1903. This one-half acre had been in cultivation for almost a century constantly in cotton. There had never been one pound of fertilizer of any kind applied to it. There had never been any other crop but cotton, which is always cultivated clean, leaving no weeds or grass to be plowed under. I inoculated the lower edge of this half acre so there would be no way for the other plot to become infected with the bacteria. I did this to make the test for bacteria application. In March I sowed 15 pounds of the best alfalfa seed I could get, from which was secured a perfect standing. The plant on the upper part of the plot made as rapid growth as that which had been inoculated. On examination of the roots I found them covered with tubercles, which proved the soil to be naturally inoculated. The alfalfa was ready to be cut July 1, four months from seeding, and produced one-half ton of dry hay. It was cut the second time about the middle of August and a third time in October, just before frost. These three cuttings produced two and one-half tons per acre, which was beyond all my expectations. I then had the soil analyzed. On comparison I found it to be the same as the chalk lands of England and France, known to be the best alfalfa land in the world. The analysis showed the supply of phosphate, potash and lime to be inexhaustible. The soil is a cretaceous formation produced by shellfish. As you know, our prairie was at one time the floor of the Gulf. We now find scattered over the fields shark teeth and other remains of salt-water fish. It is impossible to produce an acid in this soil on account of the great abundance of lime. It remains sweet under all conditions, making it a perfect soil for alfalfa. Knowing these to be the conditions, I



PICKING EARLY STRAWBERRIES.



AS NORTHERN FARMERS SETTLE IN THE SOUTH.





CATTLE ON WINTER PASTURE.

planted in the spring of 1904 130 acres. The yield from this field the first year was equal to that of the plot planted the year before. After paying all expense for planting, harvesting and marketing the crop for the year, my net returns from the meadow, which was reduced to 120 acres, as I used 10 acres of the 130 for hog pasture, was about \$1100. I sent several bales of hay from the cutting in July to the Mississippi Exhibit at the St. Louis World's Exhibition, which was awarded the gold medal over all other alfalfas on exhibition.

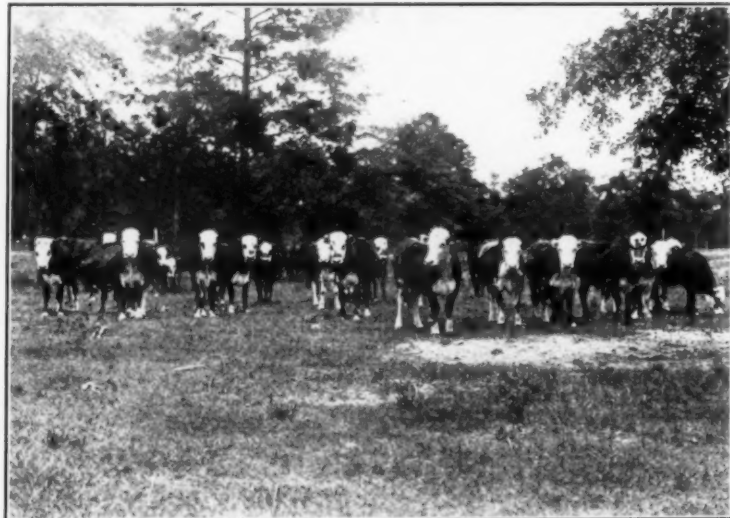
"The second year, 1905, the meadow was cut five times, making a total yield of about four and one-half tons. All of the hay was saved, most of it in first-class condition, which sold at from \$16 to \$20 per ton f. o. b. West Point. Part of the crop was damaged to a certain extent by rain, the lowest grade bringing \$12 per ton. The average yield on the average alfalfa soil in this section is about three and one-half tons per season per acre. The best grades of soil produce as high as five tons. I have sowed in the last 10 years something over 1000 acres. I now have 600 acres in meadow. I have lost the stand

are good, reasonable rates and good car service. We find that alfalfa will stand four or five years' pasturage before it is necessary to reseed. There is nothing that will equal it as pasture. It grows in perfection at 50 degrees above zero point. Eighty per cent. of the time during our winter the temperature is above that mark. The conditions are these: We have 10 or 15 days' growing weather at a time, the alfalfa flourishing, growing 10 or 12 inches in that time; then a freeze, which kills this growth. Stock of all kind seem to relish this frozen grass, and will eat it in preference to the fresh green growth. Then we have 10 or 15 days of growing weather, and again the same results. The winter pasture, in my opinion, is just as abundant and good as that in June or July. I have horses and cattle that were born in the alfalfa meadow that never have been fed grain or hay; they have never been under shelter, winter or summer, and are at all times in as good condition as the best groomed stock. We have found that alfalfa on the black land goes 'hand in glove' with Johnson grass. We have also found that hay—one-half Johnson



SILO-FED STOCK.

on part of the 1000 acres from sowing seed coming from Turkistan, which is not adapted to this humid climate. It will grow well for one and sometimes two years, then disappear quickly. I have also lost good stands by pasturing. We find that it is hard to get satisfactory results from cotton following alfalfa. The best practice is to follow alfalfa with corn, which yields from 75 to 80 bushels per acre, which would not produce over 25 bushels before the alfalfa was planted. The second year planted in cotton will produce over one bale to the acre, simply doubling the yield. We have no trouble in disposing of alfalfa hay. Most of it is sold while standing in the field, shipped as soon as it can be baled, going to the South and Southeastern States, the lumber districts in Alabama, Mississippi, Georgia and Louisiana. Birmingham market consumes 14,000 cars of hay annually. Atlanta, Mobile, New Orleans, Charleston and Savannah are as good markets as Birmingham. Our railroad facilities



HEREFORDS IN GEORGIA.

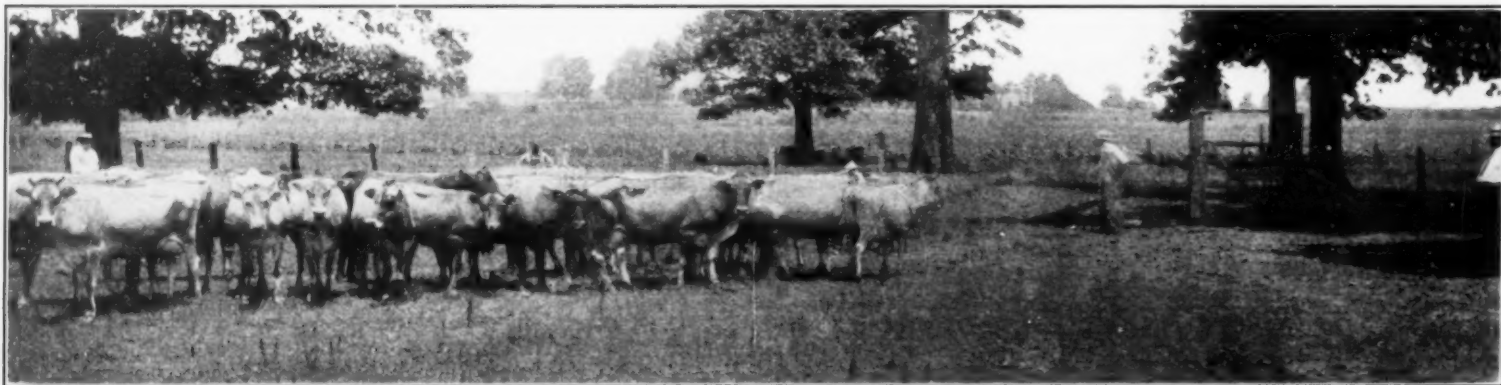
grass and one-half alfalfa—is the very best hay we can feed to driving horses. I feed it in preference to anything I can get. This class of hay is becoming very popular all over the country among the livery men. It is hard to introduce, but we find that when they use it once they will ask for it in preference to pure alfalfa, timothy or clover.

"Hoping this to be the information desired, I am,

"Truly yours,

"B. H. STRONG."

This letter indicates what has been and is being done in the South in the growing of one of the greatest stock-food products of the world. This letter has been introduced simply to show that alfalfa is especially adapted to the lime soils that abound in many of the Southern States. This gentleman's



A HERD OF JERSEYS.

experiment proved that such soil needed no inoculation to get good results from alfalfa. In the near future the Agricultural Department hopes to introduce in the South a drykilo that will successfully remove the moisture from alfalfa hay, leaving it to be ground into alfalfa meal and shipped to the markets of the world. Dairymen in Iowa and Wisconsin are now feeding alfalfa meal that comes from the factories of Nebraska and Colorado, and pronounce it in some respects the equal of cottonseed meal, every pound of which comes from the South. The introduction of alfalfa growing in the South is stimulating



A LOUISIANA DAIRY SCENE.

greater interest in stock growing and in other ways has already demonstrated its high place among the potentialities of Southern agriculture.

#### SOUTHERN FRUITS.

The South excels in the quality and variety of its fruits. The false impression obtains in the North that good apples are not grown in the Southern States. Can anyone suggest a better-flavored apple than the Albemarle Pippin, grown in Virginia, North Carolina and North Georgia? Has any of our Northern friends tried the Winesap, York Imperial or Ben Davis as grown in the Blue Ridge region of Virginia and the South Atlantic States? Have those who would criticize Southern apples ever tasted and tested the big red apples of West Tennessee and Arkansas? If not, you are not in a position to pass upon the apple productions of the South. Peaches are one of the delicious fruits grown in every Southern State. Not all of the States grow peaches for commercial purposes, but in close proximity to nearly every cabin throughout the South will be found a few peach trees that, without care, supply the inmates with peaches in their season. Georgia and several other Southern States annually ship thousands of carloads of Elberta peaches to New York, Boston and other Eastern markets, while Texas and Arkansas supply the Northern and Western markets with Elbertas and other varieties. Florida furnishes the breakfast tables east of the Rocky Mountains with delicious oranges and that best of all breakfast appetizers, the grapefruit.

Nowhere can figs be grown to perfection as in the South. If a twig from a fig tree is stuck in the ground, it will, without care or cultivation, grow to



MISSISSIPPI ALFALFA FIELD.

maturity and in a few years yield abundantly. Southern strawberries have no equal in this or any other country either as to size or flavor.

Seventy-five per cent. of the tobacco grown in this country is produced in the Southern States, Kentucky furnishing 38 per cent. of the crop.

No section of the country produces so many months in the year such a variety of vegetables and of such excellent quality.

The Gulf Coast oyster beds furnish in great quantity the best bivalves known to the trade.

Both fresh and salt-water fish abound in the streams, lakes and Gulf of the South.

The South is introducing some of the very best breeds of beef cattle and dairy cows found in any section of the nation.

Duroc Jersey, Poland-China, Berkshire and Chester White hogs have taken the place of the much-abused razor-back in every Southern State.

Every Southern State has an agricultural school and thousands of students preparing to take advantage of the possibilities of Southern agriculture.

The South, with its numerous Gulf ports and its trunk lines of railroads has access to the markets of the world.

The South has a goodly number of excellent railroads, but they must be extended to meet the demands of newly-developed territory and furnish transportation for the growing industrial and agricultural conditions of the South.

No section of the nation is appropriating so much money proportionally for public highways as the South. This represents greater agricultural possibilities of that territory.

Three of the Southern States—South Carolina, Tennessee and Florida—have over half of the phosphate deposits of the nation and of the highest grades on earth. In time the value of these deposits will be beyond computation.

An attempt to present the potentialities of Southern agriculture in a single article is like "dipping the pond dry with a teaspoon." It simply cannot be done. The agricultural resources of the South, many of which have been dormant for years, are now multiplying so fast that the closest observer cannot keep pace with them. Iowa now boasts that 86½ per cent. of her lands were in cultivation this season. The Southern States, by reason of mountain ranges, lakes, rivers and bayous, cannot hope to ever make such a showing as this, but it is not extravagant to predict that 50 per cent. of the 300,000,000 acres of unimproved wood and wet lands of the Southern States will be in cultivation, and when this is the case every figure named in this article concerning present agricultural Southern productions may be multiplied by three, and even that will only partially represent the potentialities of Southern agriculture.

### Why the West and North Had to Be Developed Before the South

A Southern man interested in mineral properties started out of Chicago one early spring day with a number of Western capitalists who had been induced to go South for the first time with a view to studying opportunities for investment there. The party left Chicago in a blinding blizzard. After traveling some hours the snow that had covered the ground throughout the early part of their journey disappeared. A few hours more and they saw signs of budding trees and the faint green of the early spring in the grasses. A little later on they awoke one morning to find a glorious spring day with the earth carpeted with wild flowers and the budding leaves bursting into full growth. The birds were singing and all nature was vocal with praise for the joy of living in such a land at such a time.

The Western men could scarcely realize that within less than twenty-four hours they had changed from a land of blinding snow and ice to a land of sunshine and the warmth of spring. One of them said to the Southern man who had taken them from the freezing North into this southern sunny paradise:

"Why is it, with such a climate, if the South has the mineral wealth and the agricultural capabilities that you have claimed, it has been so slightly developed as compared with the rich and populous North and West?"

The answer was this:

"The reason why the North and West are so far in advance of the South in development and in density of population is providential. In the early days Providence saw that if the advantages and the resources of the South should be widely heralded, population would naturally center there, and once located in the South it would never be possible to force people to go elsewhere. Thus the North and West would be left without population and undeveloped. Providence saw that the North and West, if they were to be developed at all, must be developed in advance of the world's knowing about the South. Now, in the fullness of time the North and West having been settled and enough of the people in these sections being tied down by business connections to hold them there and thus keep up prosperity, the South comes upon the field of activity and of world-wide knowledge as a part of the working out of the plans of Providence. Now, with the broadening knowledge of the South the people of the North and West who can get away will, of course, inevitably move Southward."

This story suggests another of a somewhat similar trend. A Southern minister accepted a call to a Western church. In the new home his little girl for the first time saw the bleakness of a winter of snow and ice. She had lived where the flowers bloomed during much of the winter, where the fall season is quickly followed by early spring; she had heard the birds singing throughout the year, and when in her Western home she felt the biting cold and saw the earth covered for months with ice and snow, and saw no flowers and heard no birds, her thoughts turned to the South. She asked her father one day if Heaven was divided like the earth into north, and south, and east, and west. Not catching her meaning, he expressed his surprise and asked why her question. Her reply was that if Heaven was divided into north and south she wanted when she got there to live in the south part.



# Applied Chemistry as An Asset of the South

By JAMES C. LAWRENCE, Chemical Engineer of Memphis, Tenn.



**C**HEMISTRY in all its branches is the most comprehensive and most fundamental of all the sciences. It embraces the physical basis of our bodies and those of every living thing. It is concerned directly with the air we breathe, the water we drink, the food we eat, the materials for which we labor, and the things we buy and sell. Things in general as viewed by the chemist or chemical engineer present different aspects from those appearing to the mind not chemically trained. To many people a tree is potentially boards and shingles, or perhaps a piece of furniture; whereas, to the chemical mind it suggests charcoal and gunpowder, wood alcohol, grain alcohol, acetone, tar, to say nothing of the tanneries or newspapers that may be waiting for its products.

Is it to be wondered at, therefore, that wherever we find any great improvement in the welfare of the race, any industrial or agricultural development or growth, we find also that the chemist and more recently the chemical engineer has had an active part in its bringing about?

In the past the South largely confined its energies to agriculture for maintaining a place in the eyes of the nation. Blessed with a climate most equable, and with lands, waters and crops most useful to mankind, it went its own way undisturbed. But after many years of producing the same crops on the same land, and when the people of other sections began to drift to places where rigorous climatic conditions and waning natural resources were not felt, the South was the natural mecca to which they drifted.

But what good are minerals, coal, timber, soils and other good things if we know not what to do with them? For instance, we find in some sections of this country large tracts of land having valuable mineral wealth, such as pyrites or sulphur. In the raw state the owner heretofore has simply shipped the material away to be worked up into more valuable products. But now chemistry steps in and says to the Southern owner: "Turn this pyrites into sulphuric acid which will assist you in making a valuable fertilizing material from the phosphate rock found in your locality, so that you can keep this wealth in your own section." For, by this time, it had begun to be realized that our soil required stimulating and feeding to assist it in bearing the burden of crops repeatedly thrown upon them.

In Europe, generation after generation of farmers have worked the same lands until just what crops and what stimulants are best for each individual tract is known in each family and handed down from father to son. In this new land it has been impossible to find out in such a manner, so chemistry has been called upon, and by simple analytical tests of the soils can tell the farmers just what is best for each particular soil or class of soil, enabling our farmers to accomplish in a few years' time what it has taken their foreign brethren centuries to find out.

We see, then, that in the early Southern period the scope of chemistry was somewhat limited, but none the less valuable in what it applied itself to. But as the industry of man required new lines of endeavor, chemistry was used either to explore new lines or to improve conditions in old lines, so that many others were enabled to share in the work.

Toward the close of the nineteenth century we find the chemist and chemical engineer maintaining a place in almost every industry and phase of life. In mining he has classified the minerals so that by simple tests the exact value of each can be ascertained. He has invented and discovered means of reducing the death rate in coal-mining operations by the use of fire damp indicators, rescue outfits, explosives regulation and the Davey lamp. In our contact with daily life, he has developed means for reducing contagion through the application of the pure food laws, and the regulation of public water supply and sewage disposal. He has reduced the cost of living by discovering many cheap edibles and other products available from the wastes of former generations, such as oleomargarine from packing-house material, oils from cotton seeds, glycerine and soap from waste fats, and cheaper methods of using bread flours, to say nothing of the vast improvements made in the brewing trades.

We find chemistry applied to the making of our clothes by pointing the way to larger yields of cotton and by making new textiles from the short fibers formerly thrown away with the cotton-seed hulls. A slight touch of chemistry to the cotton fiber and we have the beautiful new artificial silk. Another touch and we find the bristles of cellulose acetate, with which we brush our hair. We enter the field of manufacturing and we find all the common materials and articles which we use daily being made under the careful supervision of chemical tests. Every raw material and finished product must now stand certain tests before it is pronounced fit for sale by the manufacturer. In this way the chemist has cheapened the product to the consumer, as manufacturers have found that where they bought their raw materials for \$3 per ton without chemical specifications, they may buy the same things for \$1, if standardized and tested. He has shown us how to take waste pine wood and old stumps and make a good grade of turpentine, thus saving vast amounts of this valuable timber for lumber. From other species of woods he has shown us how to obtain paper pulp, alcohol, wood alcohol, tars, rosin, potash and many other useful articles.

From waste coal, such as is not shipped from the mines for steam or domestic use, he is making tar, coke, fuel gas, as well as illuminating gas, ammonia liquor for fertilizers and the whole gamut of colors for dyeing purposes. He has shown the large users of coal how to determine the exact amount of air necessary for complete combustion, so that they need not send their coal up the chimney, as is so often done. Along the same lines we find chemistry back of the movement in our cities to reduce the amount of smoke

sent into the atmosphere, thus increasing our lease on life and reducing our fuel bills.

Strange as it may seem, we even find chemistry a potent factor in advertising. Mr. A. D. Little, one of America's most famous chemists, records this fact in his monologue: The reader can probably remember the paint manufacturer who offered to send a small chemist's blowpipe and a piece of charcoal, the use of which would show a small pellet of lead from the paint if it were a lead paint. This advertisement was suddenly withdrawn when another paint manufacturer advertised that zinc paints were unchangeable even under the blowpipe.

In the past we have found the chemist and chemical engineer slowly and somewhat obscurely fighting their battles, and striving along a few individual lines. At the present time we see them entering more and more into our daily commercial and agricultural activities, and becoming more and more indispensable to the nation. But it is in the future, beginning at the present, that we shall see these men come into their own. As competition becomes more keen, and as all our activities become more intensive because of increased population and higher living standards, we may expect to find all manner of industries depending upon the chemist and chemical engineer for guidance upon the road to greater efficiency.

We may expect to see all the great trade wastes of the present turned into useful channels. Waste molasses should be made into alcohol for use in the arts. Sugar cane bagasse should be utilized for the manufacture of paper pulp, as should the vast fields of cotton stalks, rice straw, yellow pine mill waste and other wood wastes. The skim milk that is now either fed to hogs or thrown away by our farmers should be used for its casein content, which has a higher food value than beefsteak. Our municipalities should look into the matter of gasification of garbage, so that the gas therefrom could be used for generating power.

In the near future, we can expect to see factories along the Gulf coast making use of the salt wells that abound in that locality. These could be utilized for the manufacture of fire-extinguishing fluids, fine chemicals, bleaching powder, caustic soda, chlorine, etc. With all the great potential electric power in our Southern streams we should begin to take advantage of the air that Mother Nature has provided us with and extract the nitrogen contained therein for use as fertilizers, for the Chili nitre will not last forever. Instead of shipping the bulk of our natural sulphur away, we should center vast manufacturing plants in the regions where this material abounds, so that the value increment made possible by working it up can be kept at home.

Since the heart of the present hardwood and pine timber stands in the United States is in the South, and since we know from forest service reports and statistics that over 50 per cent. of the tree is lost as waste from the time it is cut until it is turned out as lumber, it is necessary that we take advantage of this great accumulation of waste and work it up into useful materials. The chemical engineer has made a start in this direction, but when the total number of mills that are in operation are considered, it will be seen that the field is broad enough for all. We should set up plants for the production of potash for fertilizer, creosote oil for germicides, pitch and tar for road and roofing purposes, paper pulp and other articles which by name run into the hundreds. We shall find chemistry entering the great clay industries of this section to greater advantage, showing how more useful articles can be made from certain clays and shales, and reducing the cost of making such articles as are now marketed. A few years ago it was found that the sand from a certain locality in Carolina contained the elements which made possible the brilliant gas mantles now in use. Is it too much to say that only a slight search in almost any locality could uncover materials which would prove, perhaps, not quite so valuable in a monetary way, but valuable enough to make them worth supplying to the nation?

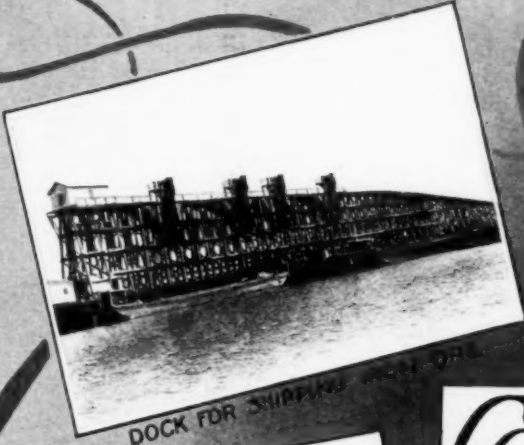
And so we might continue almost indefinitely picturing the devious and multitudinous methods by which the chemist and chemical engineer will continue to develop the latent resources of the South. However, we have pointed out in a general way the past efforts and present achievements of chemistry as particularly influencing the progress of this section. With the facts set forth above is it not an easy matter to place this profession among the live, available and tangible assets of the South, and can it be denied that the chemist and chemical engineer have played a most prominent part in making "the South the nation's greatest asset?"

TEN SOUTHERN CROPS IN 1909.

Crop.	Acreage.	Production.		Value.	
		Quantity.	Per Acre.	Aggregate.	Per Acre.
Corn . . . . .	44,552,517	809,656,165 bus.	18.2	\$547,934,000	\$12.30
Cotton . . . . .	32,042,669	10,649,119 bales.	0.3	703,592,000	21.95
Hay . . . . .	12,167,922	12,854,363 tons.	1.1	129,935,000	10.68
Wheat . . . . .	7,018,588	87,315,174 bus.	12.4	90,083,000	12.83
Oats . . . . .	4,585,227	84,856,644 bus.	18.5	42,891,000	9.35
Tobacco . . . . .	1,055,050	807,991,221 lbs.	765.8	79,183,000	75.05
Peanuts . . . . .	869,281	19,403,356 bus.	22.3	18,257,000	21.00
Rice . . . . .	610,163	21,838,520 bus.	35.8	16,020,000	26.25
Sweet Potatoes . . . . .	585,751	52,370,149 bus.	89.4	31,819,000	54.32
Irish Potatoes . . . . .	563,620	46,248,727 bus.	82.1	29,489,000	52.32
		104,050,788		\$1,689,203,000	\$16.23



WHERE COASTWISE AND FOREIGN SHIPPING MEET



DOCK FOR SHIPPING COAL AND OIL



AN RIVER STEAMBOAT LANDING

# Commerce and Trans- portation



A RAILWAY TERMINAL



MORE THAN A MILE OF WATERFRONT



BIRDSEYE VIEW OF DOCK



WITH TWO CRANES



A GROUP OF  
GRAIN ELEVATORS



IN A HARBOR THAT COULD SHELTER THE WORLD'S NAVIES



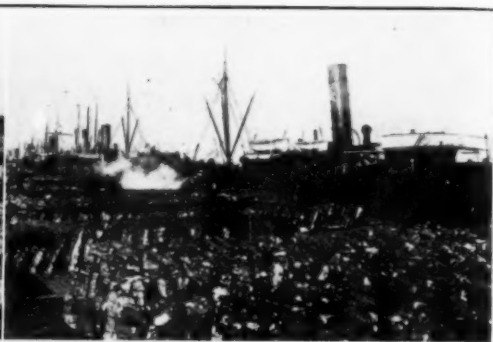
# Shipping Products By Land and Water



CONVEYORS UNLOADING BANANAS.



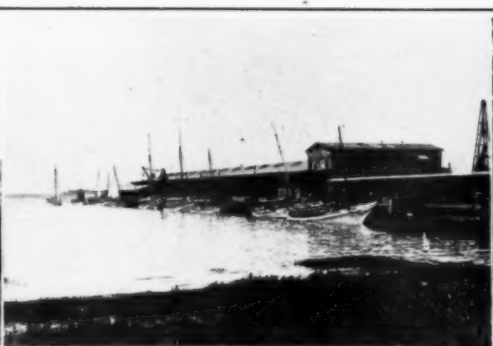
SUGAR ON THE LEVEE.



CARGOES OF COTTON.



PRE-COOLING STATION FOR FRUITS.



TRUCK IN GASOLINE MOTOR BOATS.



REFRIGERATOR CARS FOR STRAWBERRIES.



A GIANT CAUSEWAY.



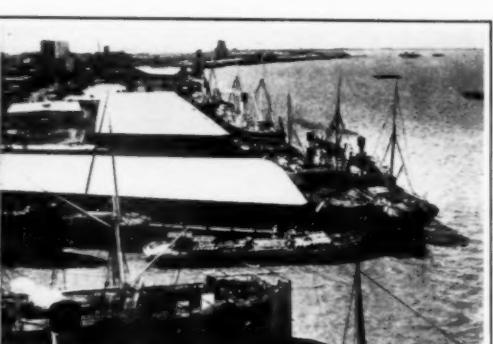
CONCRETE COTTON COMPRESS.



COASTWISE SHIPPING TERMINALS.



LIGHTERING COTTON.



FRONTING THE GULF.



CREOSOTED TIMBER AS FREIGHT.

# Immediate Task of Railroad Systems of the South

By SAMUEL G. WILMER.



RAILROAD development in the South today is directed in a general way with particular regard for the influence which the opening of the Panama Canal is expected to have upon the business of transportation. Much construction that the trunk roads have accomplished during the last ten years will be conveniently available for traffic moving in connection with water lines operating by way of the canal. Yet considerable remains to be done if they are to be prepared in the beginning of the new conditions to adequately handle the situation then presented. Thus far some of the largest systems in this section have done practically nothing to show that their officers apprehend anything more than a normal increase of traffic demands during the next few years. Yet one of them—the Louisville & Nashville Railroad—has embarked upon liberal and extensive double-tracking, part of which, in Tennessee, includes the construction of an entirely new two-tracked road about 75 miles long, notwithstanding the fact that the company now has a single-tracked line between the two principal points which the new route will connect. But the construction that it is now pushing to completion will provide a line of easy grades and curves, permitting the establishment of a low rate of operating cost, and, consequently, increased profits to the company.

It is true that on the Southern Railway the work of double-tracking its main line between Washington and Atlanta is proceeding, and it has also done much in the way of constructing long and frequent passing tracks on the line from Atlanta to Macon, thus giving to that part of its system an operating capacity almost equal to a two-tracked road, and doubtless sufficient for its immediate requirements, yet much remains to be done, especially at seaport terminals—New Orleans and Mobile, for instance—to place the company in readiness for the traffic development which thoughtful men recognize will early follow the dedication of the canal to its purposes.

There are those who entertain an opinion concerning the canal and its influence upon North America which is not, to say the least, complimentary to those responsible for its completion, namely, that the shipping interests and the industries of Great Britain will reap more benefit from using the great waterway than will the business interests of this country. But it is not to be expected that this unfair distribution of advantages would continue indefinitely. Being prepared and already extensively in the markets of the world, it goes without saying that England will immediately and largely profit by the opening of the new way through the Isthmus. So will Germany, which has been pushing her export trade for a number of years so that her flag is almost as frequently seen in the various ports as is the Union Jack.

These are facts, yet in spite of them the products of America will have to be obtained by the various countries of the continent to the south of us and by the eastern countries of the great continent on the other side of the Pacific, not to mention Australia and the thousand islands lying between us and her shores and the Asian and African coasts. Our railroads must transport those products to the seaports and ships must carry them thence to those who demand them. It need matter naught to the railroads which flags those ships fly, be they British, German, or what not. The vessels will be there after our iron, our grain and our oil, both in their crude and in their manufactured states, and it is the imperative duty of the land transportation companies to provide adequate means to freight those and other commodities to the seaports, and also to convey therefrom the imported things which the water craft will bring hither.

Apparently, the railroads mostly are hesitating about the question of business to come to them directly in consequence of the canal. Temporary lack of ability to obtain more financing may be partly responsible for this seeming apathy, or it may be that most railroad men incline to think some time will pass before any unusual demands will be made upon their facilities in consequence of extraordinary development of our industry and commerce following the canal opening. But whether this or that be responsible for their failure to live up to the needs of the immediate future, the impressive fact exists that those railroads which are now preparing for the business will be most ready to get and hold it when it comes, and most likely to gather the ultimate profits from handling it.

Therefore, if those other railways which have accomplished little or nothing of preparation bestir themselves immediately they will not be much too late for the situation which will be upon the country by 1915. What is needed is more of everything going to make a first-class railroad, more second track, larger terminals, more equipment. The situation of the lines in the South, with respect to second track, is shown by a little figuring and comparison. In the Middle Atlantic States there are 26,845 miles of railroad, that is length of lines or only first track. In addition, there are 10,063 miles of parallel or

second track, which is equal to 37½ per cent. of the total, but in the South Atlantic States, with 30,418 miles of first track, there are in addition thereto only 1848 miles, or 6 per cent., of second track, and in the Gulf and Mississippi Valley States the second track situation is even worse, there being, with 15,402 miles of first track, only 283 miles of second track, or less than 2 per cent.

In the case of the South Atlantic States this wide disparity seems all the more peculiar because of their larger first track mileage as compared with the Middle States, yet it must be remembered that the density of traffic is vastly greater in the latter section. Even so, comparing the South Atlantic group with the middle group of States, it is found that the former has nearly 29 per cent. as many locomotives and about 26½ per cent. as many freight cars as does the latter. To operate successfully and economically this amount of equipment (and the roads require more), it would seem quite necessary that its mileage of second track should be much more than 6 per cent. as compared with the total. The Gulf and Mississippi Valley States also have over 17½ per cent. as many locomotives and over 15½ per cent. as many freight cars as the Middle States; consequently their lack of second track appears woefully bad. The railroad freight tonnage of the South Atlantic States is, moreover, 20 per cent. of the tonnage of the Middle States, and that of the Gulf and Mississippi Valley States is 10½ per cent. of the same. All these figures reveal emphatically the need for more second track and other facilities.

The Atlantic Coast Line, as well as the Southern Railway, has realized

the great value of second track and is constantly increasing its amount of double-tracked line. It has also made other valuable improvements upon its main line from Richmond to Jacksonville by putting in modern bridges over important streams and in various ways adding to the efficiency of this part of its system. But in Florida it has shown itself rather indifferent to opportunity. Yet the company has recently displayed a partial sensibility to the necessity of meeting the demands of the public, as well as of competition, by undertaking the construction of a connecting link—which is now well advanced—to give it a west coast route for traffic to and from Tampa, all of which now has to enter or leave the State via Jacksonville, a round-about way in comparison with its new enterprise.

At Tampa the Seaboard Air Line grasped an opportunity to secure a most valuable seaport terminal, and it has, furthermore, obtained control of the Tampa Northern Railroad, a west coast route that will be of decided advantage to the system. The

Seaboard is also growing in other ways. It has a short and fast route to and from Florida points, with an excellent network of roads in that State which were formerly known as the Florida Central & Peninsular Railway. It has its own line into Richmond and it extends westward as far as Birmingham and Montgomery. In South Carolina it has lately acquired several new and valuable feeders and promises to obtain some like advantages in North Carolina.

These three trunk lines—the Southern, the Seaboard and the Atlantic Coast Line—are naturally expected to do most in the way of increasing facilities for the Panama Canal business, especially in the eastern part of the South; yet the Southern Railway, as it extends to New Orleans and even beyond the Mississippi in the northern part of Louisiana, will be looked for to do even more than either of the others, although the Coast Line, with its control of the Louisville & Nashville road, may be said to cover practically as great an amount of territory as does the Southern, even if this be indirectly done. Its influence is also being further extended westward through the alliance of the Louisville & Nashville with the Frisco System in controlling the New Orleans, Mobile & Chicago Railroad, of which great things are anticipated, including a new entrance to New Orleans.

How far westward will the Seaboard establish connections is problematical, but that this system must do so is apparent. Its possible value to some Western system through a traffic arrangement is so plain as to need little comment or explanation. In view of the extent of the Southern Railway, and also because of the Atlantic Coast Line-Louisville & Nashville combination, including as it does the Nashville, Chattanooga & St. Louis Railway, it would seem particularly appropriate if the Seaboard and the Illinois Central, for instance, struck up a friendship for mutual advantage and profit. While the Illinois Central already has control of the Central of Georgia, with which it connects at Birmingham, the value of the Seaboard in many other ways is so great that a junction of the two would be quite as good a thing for the Illinois road as it would for the Seaboard. Notwithstanding that there have been occasional rumors of a possible close relationship between the Seaboard and the Frisco, via Birmingham—which they both enter—it would seem that

## INCREASE IN SOUTHERN RAILROAD MILEAGE.

States.	1880.	1890.	1900.	1910.	1912.
Alabama.....	1,843	3,422	4,197	5,176	5,421
Arkansas.....	859	2,203	3,109	5,034	5,230
Florida.....	518	2,490	3,256	4,727	5,107
Georgia.....	2,459	4,601	5,730	7,196	7,442
Kentucky.....	1,530	2,942	3,094	3,726	3,976
Louisiana.....	652	1,740	3,801	5,234	5,392
*Maryland.....	1,040	1,391	1,364	1,588	1,615
Mississippi.....	1,127	2,471	2,934	4,234	4,316
Missouri.....	3,965	6,142	6,887	8,071	8,232
North Carolina....	1,486	3,128	3,733	5,299	5,574
Oklahoma.....	289	1,261	2,399	6,106	6,461
South Carolina....	1,427	2,289	2,919	3,330	3,598
Tennessee.....	1,843	2,767	3,185	4,004	4,143
Texas.....	3,244	8,710	9,992	15,070	15,843
Virginia.....	1,893	3,360	3,795	4,609	4,643
West Virginia.....	691	1,433	2,485	3,680	3,937
<b>Total.....</b>	<b>24,866</b>	<b>50,350</b>	<b>61,880</b>	<b>87,084</b>	<b>90,930</b>
<b>United States.....</b>	<b>93,262</b>	<b>166,703</b>	<b>194,321</b>	<b>245,000</b>	<b>252,000</b>

\*Includes District of Columbia.



there is now less likelihood than ever of such a thing, because the Frisco has established a friendship with the Louisville & Nashville, which is the Atlantic Coast Line's own.

It has long been expected that the Central of Georgia would build an extension into Pensacola, and rumors of this from time to time have been officially denied. But there is an independent and as yet small road operating northward out of Pensacola and into Alabama, which might afford the two Centrals (Georgia and Illinois) entrance to that Gulf port. This is the Gulf, Florida & Alabama Railway, the nucleus of which was the railroad of the Southern States Lumber Co., from which, beginning at Cantonment, an extension of about 20 miles was built and lately finished to Pensacola, thus making available a total of about 90 miles of road, most of which is a main line from Pensacola, Fla., to Local, Ala., 70 miles, and from which latter point an extension northward is being built. The possibility, not to say probability of this new line becoming a terminal route for a trunk system, is an interesting feature of the railroad situation in the South.

In this section, however, the Florida East Coast Railway occupies the first position of advantage with respect to Panama Canal traffic. Its 525-mile line from Jacksonville to Key West, a port way out in the Gulf of Mexico, carries its trains well down toward the tropics, with a terminus only 90 miles north of Havana and easy of access for ships from everywhere. At Jacksonville this line connects with all three of the large systems in the South Atlantic States, and it will thus be able to handle traffic to and from all of them as may be desired. It might seem that the Southern Railway would most likely avail itself of this connection to a greater extent than either of the other roads, because both the Coast Line and the Seaboard have their own seaport terminals in Florida.

Over in the western part of Alabama there is another north and south road lately finished, which promises to become an advantageous Gulf outlet for some system. It is formed by the connection (recently accomplished) of the Tombigbee Valley Railroad and the Alabama, Tennessee Northern Railway, which are known as the Cochrane Lines, having been planned and built by John T. Cochrane of Mobile, who is working on plans for an extensive seaport terminal—for which he has a waterfront site—at Mobile. While the Cochrane roads enter that city via the Southern Railway, they have a deep-water terminal of their own even now at Nannahubba Bluffs, about 30 miles above Mobile, on the Tombigbee River. There are predictions that this line will become a great coal-carrying route in the not distant future. Undoubtedly it possesses valuable characteristics.

The Gulf & Ship Island Railroad is another line of which something important may be expected. Gulfport is steadily developing and the value of the railroad seems bound to increase. Some trunk line with Chicago headquarters might take a fancy to this rail highway as a means of reaching a port on the Gulf of Mexico.

Besides these, there are sundry other plans—most of them yet on paper, but some upon which construction has begun—all the way from Florida to Texas.

Notwithstanding that the railroads in this section have apparently done so little toward meeting the Panama Canal situation—although they consider it in their development work—the South has seen more railroad construction this year than have other parts of the country. Excepting in this territory, 1912 was a very lean twelvemonth for the railroad builders. But, as was pointed out recently in the Manufacturers Record's annual review of railroad construction, the amount of new track laid in the South since last winter was actually greater than in 1911. This is not to be wondered at in view of the natural wealth of this section and its assurances for the future.

If the region around Birmingham was the only natural storehouse in the South for mineral wealth, no thoughtful individual would say that it had railroads enough. That it hasn't is proven by the fact that other and new railroads are endeavoring to build lines into that district. But it is only one of several sections rich in Nature's gifts of coal and other mine products. Virginia, West Virginia, Kentucky and Tennessee contain mineral territory, the wealth of which is almost beyond the bounds of excited imagination. These all require transportation facilities, and they are obtaining by degrees railroads suitable to their needs.

One of the most impressive mineral and railroad developments is that witnessed within the last three years in connection with the acquisition of extensive coal fields by the Consolidation Coal Co. in the eastern part of Kentucky. This has resulted in the building of two important railroads to haul out the fuel and the entirely new town of Jenkins, Ky. The first line to reach this new-born community was the Sandy Valley & Elkhorn Railway, 28 miles long, which connects with the Chesapeake & Ohio Railway at Shelby, Kentucky. It was built by the Baltimore & Ohio Railroad under an arrangement with the coal company, and the Baltimore & Ohio is now operating the line in connection with its Cincinnati, Hamilton & Dayton division, the coal being hauled out, after reaching Shelby, via the Chesapeake & Ohio Railway to the Baltimore & Ohio's main lines. The other line is that of the Louisville & Nashville Railroad Co., which extended its Lexington & Eastern road from Jackson, in Breathitt county, 100 miles, to the new coal operations, which are in Letcher county near the Virginia boundary.

There is another coal road of the Louisville & Nashville's immediately to the southwest of this—in Harlan county. It is the Wasioto & Black Mountain Railroad, about 60 miles long, from Orby to Benham, Ky. This was lately finished and is getting out both coal and timber. There is talk of this going through the Cumberland Mountain and connecting with the Louisville & Nashville's line on the other side at Big Stone Gap, Va., only a few miles from Benham, or it is possible that the connection may be made at Norton, Va., also not far away. To the northeast of this and the other lines mentioned, and on the other side of Pike county, Ky., the Norfolk & Western Railway has built a branch recently from Williamson, W. Va., up Pond Creek to get out the coal from several operations there, and the Chesapeake & Ohio has a charter, which may be used at any time, to build a line from its Big Sandy

division at a point near Pikeville, Ky., eastward up the Levisa Fork of that stream and into Buchanan county, Va. There are mountains of coal in those regions, and the matter of mining it is only a question of time to show that it is needed. Just south of this projected road is the extension of the Clinchfield Railway, which is working up through many natural obstacles from Dante, Va., to connect with the Chesapeake & Ohio Railway at Elkhorn City, Ky. A year or so more will see this important route completed and a new highway made for the hauling of coal from the Clinchfield mines in Russell and Dickenson counties, Va., to the west and northwest in addition to its present route southward.

One of the most important railroad extensions that is pending is the line which the Illinois Central Railroad Co. contemplates from Jackson, Miss., over to Birmingham. Surveys have been made for it, and construction, while it may be deferred, appears to be assured. The value of such a road to the system is readily to be seen; it would afford a direct route between the great industrial center of Alabama and the Illinois Central's Gulf terminal at New Orleans; besides it would be of great advantage to the company in connection with the Central of Georgia Railway, which it controls, and with which its present route from the northwest into Birmingham connects at that city.

Another most important road in the way of a connecting link, one that has been built within the last year or two, is the Winston-Salem Southbound, constructed by the Atlantic Coast Line and the Norfolk & Western Railway for their joint accommodation. This provides an easy and very direct way for interchange of business between the two roads via Florence, Wadesboro, Winston-Salem and Roanoke, and incidentally gives the Atlantic Coast Line a connection with the Louisville & Nashville property via Norton, Va. The new link is operated by the Coast Line. It is about 90 miles long and is built up to high-class modern standards for heavy traffic.

Attention must also be given to what has been accomplished in the way of improving terminal facilities, the importance of which is commanding more and more attention. At Aransas Pass and at Freeport, Tex., new coast terminals are being created, of which great things are expected. Galveston is improving and extending her terminals, and at Texas City, close by, there is more doing. Houston is likewise extending and enlarging. At Dallas a union terminal plan is progressing. New Orleans will have an important addition to her terminal facilities in what the Texas & Pacific Railway will do. The Louisville & Nashville is improving its terminals at Pensacola. Tampa has seen important improvements, especially by the Seaboard Air Line. Jacksonville has also been improved, so that the facilities for traffic between rail and water are better than ever. But much remains to be accomplished at various points. Charleston expects more terminal accommodations for her railroads and is expecting the advent of new lines, especially the Clinchfield, although talk about that new road getting down to the sea over its own tracks has diminished pending the completion of the extension northward in Virginia. There are also some improvement plans for Norfolk and a union terminal has been built there.

Taking a look westward, Memphis is found to have obtained a union terminal station accommodating several of its lines, and an extensive plan is proposed for the construction of another large terminal in which the others shall find accommodation and which includes in connection a plan for the construction of another large bridge over the Mississippi River. At Kansas City a wonderfully large and commodious union station is being erected at a cost of many millions, the expense covering, of course, the acquisition of the ground upon which the improvement stands. This is expected to be finished in about six months.

While all these terminal plans are important, those at seaports loom more important to railroad men generally because they mean so much for freight traffic, in which line of service the great bulk of railroad revenues are gathered. The big union stations for passenger business are impressive to the public at large, yet the wharves and docks, the elevators, the coal piers, the phosphate and ore handling machinery, unimposing as they may be to the average man, hold the eye and awake the imagination of the experienced railroad manager as can nothing else.

Before closing this article there are certain features of the railroad situation in Texas and Oklahoma that must not be overlooked. One of these is the through line which the Santa Fe System is just finishing in the western part of the Lone Star State for a short route between the Gulf of Mexico and the Pacific Ocean. Much of it is already in operation, and the last link of the extension—about 90 miles of road—is now in process of completion. Then there is the Missouri, Oklahoma & Gulf Railroad, which is under construction in both States and which appears likely to become part of a great trunk line system. It has constructed considerable new track during the last year and promises to build at least 100 miles more before another twelvemonth has elapsed.

But there are so many other wonderful possibilities in the Southern railroad world that to enumerate and describe them in detail would not elucidate conditions as well as do general remarks outlining the situation and revealing in a broad way the trend of development. There is no lack of opportunity for enterprise and capital, and the many new charters and incorporations which are reported in the Manufacturers Record every year show that potent forces are steadily at work to lift the South to a higher and higher plane of industry and progress, and although all these various plans may not be consummated, so many of them do realize the ambitions of their promoters that more and more extended facilities for intercommunication and transportation are provided, the general welfare is greatly enhanced, property values rise, and agriculture, manufactures and commerce are stimulated steadily and healthfully.

The future is bright. Never have prospects in the Southern States been so encouraging as they now are. Capital is investigating and investing with respect to providing better transportation facilities and the construction of many new railroads is assured.

# Latent Power in the Streams of the South



**O**F 5,000,000 primary horse-power developed annually for Southern industry, 1,000,000 is derived directly or in hydro-electric development from Southern streams. The minimum primary power from streams now utilized is only about one-sixth of such minimum power that can be made available and about one-tenth of the maximum available, computed upon the theory that it is good practice to provide an installation for developing the power assuring a continuance for six months of the year, with a provision for maintaining the service the rest of the year by means of auxiliary fuel power plant. This maximum by no means implies the ultimate limit of water-power resources, for experts estimate that a thorough system of storage facilities in the several streams will increase the minimum from three to thirty times, according to the character of the streams.

What this really implies appears in an application to the 5,000,000 minimum horse-power in Southern streams of the calculation made five years ago by the National Geological Survey as to the possibilities in the minimum of about 2,800,000 indicated horse-power in eleven of the streams which have their headwaters in the Southern Appalachian Mountains. The estimate is that at least 50 per cent., and probably much more, of this indicated power was available for economic development; that the rental of 1,400,000 horse-power at \$20 per horse-power per year would yield an aggregate of \$28,000,000, and that that amount equaled an income at the rate of 3 per cent. from an investment of \$933,000,000. The indicated minimum in these eleven streams is about 57 per cent. of the 4,918,910 estimated minimum horse-power in all the streams of the South, and it is a fair conclusion, therefore, that the power in these streams represents a latent industrial capital of quite \$1,750,000,000 as the streams are today.

All these estimates are upon the minimum power basis. The possibilities wax as the maximum power is considered and become far, far greater in connection with a study of the opportunities in systematic storage.

The assumed maximum development possible in all Southern streams is about one-seventh of the total in the country, and the estimate of the total power available in the country, with full provision for storage, is more than 230,000,000 horse-power, which, it is estimated, could make possible an installation of at least 200,000,000 horse-power if every storage site should be utilized and the water properly handled. The South's share in such utilization could hardly fall below 20,000,000 horse-power, which, at \$20 rent per horse-power a year, would mean \$400,000,000, equal to 3 per cent. gross income upon a capital of \$13,000,000,000 and a primary horse-power for the development of energy for manufacturing, transportation, lighting and heating four times as great as the primary horse-power now developed for industry.

No person living today will see the approach to such a finality in the development of Southern water-powers, but to the \$100,000,000 already invested in their development and the \$150,000,000 more now going into like investment other hundred millions of dollars will be added within the next few years as appreciation increases of the tremendous benefits that will accrue to the South.

In the old days certain Southern water-powers were used in the operation of the primitive catalan forges, the flour and grist mills and the cotton mills,

and the open winters of the South were held to give a distinct advantage to Southern mills over those in the North, where winters were severe. In the

earlier stages of the age of steam the importance of water-powers in industry was obscured, especially as industrial centers tended to be established convenient to railroad transportation and far removed from power streams. All that situation has been changed by the adaptation of electricity as a means of transmitting power, which has been brought to such a degree of efficiency that a beginning has been made of burning coal at the pit's mouth for the development of electrical power for transmission. The South was promptly in the field to avail itself of the new equipment for progress. Nineteen years ago the first electrically-equipped cotton mill in the world began operation at Columbia, S. C.; two years later a mill at Anderson, in the same State, first installed direct-connected spinning frame motors, and three years ago a mill at Greenville introduced the individual drive in its weaving department, making fine goods. Meanwhile, electricity is coming into greater and greater play in the mineral and lumber industries of the South, in the manufacture of aluminum from bauxite and in the derivation from atmosphere of nitrates for the manufacture of fertilizer. Electric lighting (quite frequently in connection with ice factories and cold-storage plants), street railway systems and interurban lines are among the other activities calling for more and more electricity from the streams, which have really hardly been tapped, in view of their immense potentialities.

Hydro-electric development is one of the most important of the influences to the conservation of natural resources—that is, the economic use of such resources up to their full capacity. And it means not only the creation of wealth from material which has been going to waste for centuries, but also the necessity for a scientifically practical handling of the forests, protecting the headsprings of the rivers. Fortunately, the policy of forest conservation on a comprehensive scale has been inaugurated in the Southern Appalachians, in which are the sources of probably two-thirds of the water-power of the South. Forestry and hydro-electrics, carried to their perfection, will have an important bearing upon the maintenance of an equable flow of water in the rivers of the South, so necessary for the internal commerce of the country in relation to foreign trade, and will also reduce to the minimum the danger to life and property by freshets. The establishment of storage systems wherever possible along the power streams will be essential to the full result. That undertaking opens up an engineering program second in importance only to that of agricultural engineering, which is a comparatively infant science. In the latter domain hydro-electrics are still to be profitably developed on a scale justified by the conditions.

In the estimates of minimum power have not been included the streams having less than 500 horse-power. There are many such in the South, some of them in the mountains, far removed from tillable land or habitable surroundings, but others running through Piedmont farms. The great majority of them serve at present for

nothing save as water supplies for stock, but in a few instances they have been so utilized as to demonstrate the potentialities in the many. For instance, the Geological Survey of Tennessee tells of a water-wheel on a dairy farm near Greenville in that State which runs a feed grinder, grist mill, ensilage

## RESOURCES OF POWER IN SOUTHERN STREAMS.

Rivers.	Drainage Area, Square Miles.	—Estimated Horse-power—	
		Minimum.	Maximum.
Potomac .....	14,300	176,000	462,000
James .....	10,400	196,000	300,000
Chowan .....	5,000	5,100	10,100
Roanoke .....	9,740	205,000	343,000
Tar .....	4,360	4,000	8,000
Neuse .....	5,550	5,000	10,000
Cape Fear .....	9,030	40,000	80,000
Peedee (Yadkin) .....	10,600	222,000	334,000
Santee .....	14,800	400,000	590,000
Savannah .....	11,100	290,000	438,000
Ogeechee .....	5,140	4,300	10,700
Altamaha .....	14,100	57,600	94,000
Apalachicola .....	18,800	204,000	326,000
Tombigbee .....	42,100 {	50,000	100,000
Alabama .....		275,000	487,000
Sabine .....	20,700	2,020	5,050
Trinity .....	17,700	3,180	12,800
Brazos .....	48,800	7,460	20,900
Colorado .....	39,000	28,100	55,700
Guadalupe .....	10,500	36,000	43,400
Rio Grande .....	248,000	267,000	545,000
Pecos .....		55,000	87,800
Ohio .....	204,000	40,000	100,000
Tennessee .....		1,210,000	1,950,000
Cumberland .....		76,800	159,000
Green .....		11,400	28,500
Kentucky .....		18,100	45,100
Licking .....		5,360	13,400
Big Sandy .....		21,700	57,600
Kanawha .....		402,000	1,020,000
Monongahela .....		71,000	283,000
Osage .....		7,890	19,000
Arkansas .....	177,500	110,000	182,000
Cimarron .....		11,500	44,000
Canadian .....		83,900	348,000
Red .....		48,900	148,000
Minor Streams .....	312,520	267,600	449,300
	1,253,740	4,918,910	9,210,350

## Southern Developed Water-Powers, 1908.

States.	Number.	Horse-power Developed.
Alabama .....	1,382	161,694
Arkansas .....	203	5,868
District of Columbia .....	1	1,000
Florida .....	166	4,539
Georgia .....	1,596	166,587
Kentucky .....	691	14,156
Louisiana .....	64	1,184
Maryland .....	496	21,715
Mississippi .....	273	7,922
Missouri .....	277	10,107
North Carolina .....	2,614	162,284
Oklahoma .....	25	2,994
South Carolina .....	846	207,242
Tennessee .....	1,793	95,060
Texas .....	147	9,966
Virginia .....	2,243	100,123
West Virginia .....	525	20,500
Total .....	13,342	992,941



cutter, separator, churn, circular saw and grindstone, and pumps spring water to the house, and suggests the possibility in electricity in describing a development of 70 horse-power at Glenraven. At a dam 100 feet long and 11 feet high is a 35 horse-power generator with a 30 horse-power motor a mile away. The owner operates a 25 horse-power grain mill by day with the power which furnishes electric light for his home at night. By means of an additional motor he pumps the necessary water, and he says that he regards his investment as a profitable one, because everything can be done with electricity, from shearing sheep to threshing wheat. His belief is justified by practical

results obtained elsewhere in lighting, heating and cooling the farm home and in doing the chores.

At whatever angle the subject of Southern water-power is approached, the wide scope of hydro-electric possibilities becomes apparent. Sources of power abound in the billions of tons of coal, the unmeasured volumes of petroleum and natural gas and the peat of the South. It will be hundreds of years before all such sources shall reach exhaustion. Even if such a time ever draws near, there will still be a source of limitless power in the streams which have been effectively chained to the electric generator.

## The South's Interest in Improved Waterways

By UNITED STATES SENATOR JOSEPH E. RANDELL, President of the National Rivers and Harbors Congress.



o portion of the Republic is more interested in the improvement of waterways than the South. Taken as a whole, the Southern States have a greater percentage of navigable water courses than any other part of the Union. Certainly they are much better watered than the Western States, and are not as well served by railroads as the States of the North and East.

In many respects, the South is undeveloped. A great many million acres of the finest land on the continent are still in a state of nature, covered by forests and vegetable growth in most States, and partly by water, over large areas of the most fertile soil in North Carolina, Florida and Mississippi. The crying need of the South is immigration and capital to develop its wonderful resources of forests, minerals and soils. We could readily support a population several times as large as we have at present, and as we grow in numbers the great problem of transportation will become more and more important.

For the last twenty years every part of the South has been making magnificent progress, and today it is the mecca for ambitious, enterprising, pushing men from every section of the Union as well as foreign lands. If Horace Greeley were alive today his advice to young men would be "Go South." When he said to them "Go West," a great field opened there and many fortunes were made by following his sage counsel. The scene has shifted. The great opportunities of the West have been seized, but there are innumerable openings in the South awaiting fertile brains and vigorous hands.

Throughout the nation the greatest interest is being evinced everywhere in good roads, and the South is no laggard in this respect. Our people are wide awake and doing their parts with energy and much determination. The fever of railroad building seems to have abated somewhat and is hardly keeping up with the national growth in roads and waterways. Perhaps the near future will see a revival of railroad building, and I hope so, for railroads are the greatest agents of material progress on earth; but for the present, in the trinity of road, river and rail, there is more activity in the two former than in the latter. I trust these three agencies will work together in hearty sympathy and accord without any rivalry, each feeling that there is business and glory enough for all three and each willing to let the other do its own part. The railroads have all they can attend to at the present time, and, where well managed, their business is profitable.

No community ever made a better investment than when it constructed a first-class public road, and my earnest hope is that every one of our Commonwealths will vie with the other in trying to get the best roads in the Union. Railroads are built and owned by individuals and corporations for public use and private profit. Public roads are made by communities and States for the common use of everyone. Waterways are the property of the entire Union, and, belonging to the nation, they are improved by it and are free to all comers on equal terms. The peasant in his birchbark canoe and the ordinary citizen with a gasoline launch use these waters with the same freedom as the millionaire in his floating palace. States and local communities have done very little in the way of waterway improvements except in some isolated cases, because of the fact that over one hundred years ago Congress passed a law declaring that the navigable waterways should be and forever remain the property of the nation for the use and enjoyment of all the people. But while this has been the position of Congress since 1796, very small sums were appropriated to improve our water courses until within the past forty years, and fully one-half of the total expenditures for this purpose were made within the last fifteen years.

Owing to the fact that there was so much more development and population in several other parts of the Union than in the South, waterway improvements have gone on there more rapidly and are nearer completion in many States than throughout the South, taken as a whole. I do not mean to convey the idea that there has ever been partiality or partisanship in the expenditures on waterways. Indeed, it gives me pleasure to state that during my twelve years' service as a member of the Rivers and Harbors Committee of the House of Representatives I have never seen the least appearance of sectionalism or politics in the appropriations made by that great committee. The point I make is that the South, owing to the effects and losses of the Civil War, the complete change in her business and property systems wrought by the abolition of slavery, and the awful reconstruction period, was slower in developing than the Western, Northern and Eastern States. Hence, as Congress appropriated for waterways in proportion to the needs of commerce, those sections which had so much greater commerce than the South received larger and earlier recognition.

Transportation enters into the daily life of everyone, affecting all that we do, the food we consume, the clothing that covers us, the house which shelters us from summer's heat and winter's cold, the fuel which cooks our food and warms us in winter—indeed, there is nothing in the practical business of life which is not affected more or less by the cost of conveying things from the

one who sells to him who buys, and the heaviest taxes we have to pay, much greater than all other taxes combined, are those paid for transportation.

The question of moving freight is the most important in the commercial world, and that country or community which solves it best and quickest is bound to win in the race for commercial supremacy.

Along the Atlantic Coast is a fine system of bays, sounds and rivers, extending from Delaware to Florida, which can be connected at reasonable cost and so linked together as to form a continuous whole, enabling freight to pass to and fro throughout the entire coast section in small boats without undergoing the danger and expense of sea travel, and very much cheaper than by rail. Many of the rivers of this section extend from the sea well into the interior, and if improved by canalizing and other proper methods they will become great freight carriers; will aid materially in preventing freight congestion, such as sometimes exists at great public loss; and will also cheapen rates substantially. The principal rivers of this region are the Potomac, James, Pamlico, Tar, Cape Fear, Congaree, Savannah, Oconee, Altamaha and Ocmulgee, everyone of which has natural advantages over European streams, which have been highly improved and carry a large commerce.

Florida has a perfect network of waterways, its chief river being the St. John. On its coast are several good harbors where great cities are rapidly growing up and many rivers penetrate its interior.

In Western Georgia and Alabama are the Coosa and Chattahoochee, excellent not only for navigation, but especially designed by Nature for generating enormous electrical water-power, which will prove a source of incalculable wealth. And there are many streams throughout the South on which the improvement for navigation can be made to advantage along with the development of electricity.

In Alabama the Alabama, Warrior, Black Warrior and Tombigbee systems of rivers permeate every part of the State, penetrating one of the richest coal fields in the world and carrying to the Gulf Coast a bountiful supply of this great necessity of life at prices so cheap as to seem almost beyond comprehension.

The Father of Waters bounds Mississippi on its western border, and it, together with the Yazoo system and several streams, notably the Pearl River, which empty into the Gulf, give many sections of that State the benefits of water transportation.

Louisiana is divided into sixty parishes, and every one of them, except four, is reached by a stream which is being navigated or susceptible of improvement at a reasonable cost, the main arteries being the Mississippi, Red, Ouachita, Atchafalaya, Teche, Lafourche, Tensas, Black, Calcasieu and Terrebonne, and there are many others nearly as important. In my own Congressional district in Northeastern Louisiana there are over two thousand miles of navigable waters, and in the southern part of the State there is a perfect network of bayous, rivers, bays, lakes, etc., making of the coast section a veritable Venice on a grand scale.

Texas, though very rich in many things, is not so favored by Nature in rivers as some other parts of the South, yet it has several good streams—the Red is along its northern frontier, the Sabine on its eastern, the Trinity, Brazos and Colorado reach far into the interior; and along the Gulf are a series of water courses now being connected by the Intercoastal Canal from the Mississippi to the Rio Grande. This canal will be a combined artificial and natural channel, seven hundred miles long, connecting all the coastal waters of Louisiana and Texas and permitting continuous barge traffic through the most productive and populous portions of those Commonwealths.

Leaving the coast we find Arkansas, Oklahoma, Tennessee, Kentucky, West Virginia and Missouri, all of which are traversed by many streams, a number of which are in good navigable condition and others being rapidly improved by the general Government. The Ohio, which bounds Dixie on the north, will perhaps carry for years a larger commerce than any river in the Union except the Detroit and St. Mary, which are the connecting channels between the Great Lakes. The Tennessee and Cumberland are tributaries worthy of this great parent, and destined to become very large freight carriers. The Arkansas penetrates a wonderful region through two States, and the White and St. Francis are quite important. The giant Missouri stretches far beyond the confines of the South and once enjoyed a large commerce, which should return to it. And the Mississippi system contains 16,000 miles of navigable rivers, most of which are in the South.

When the general plan for the improvement of every worthy water course in the Union, which has been so strongly advocated for years by the National Rivers and Harbors Congress, is carried out, and every interior stream, together with the harbors along the Great Lakes, the Atlantic, the Gulf and the Pacific have reached their full development, freight can be carried by water to nearly every community in the South, and at rates very much cheaper than the rates now charged by railroads.

In conclusion, I beg to say as a representative of the South, a citizen of

Louisiana, and a dweller on the banks of that mighty stream—the Mississippi—which is fed by the accumulated rainfall of twenty-four States and part of the Dominion of Canada, that all the people of the South are deeply interested in waterway improvement and anxious to see our Government liberal to every part of our country in this respect. We do not ask favors, we ask merely the wise, business-like improvement of every worthy water course in Dixie, which is justified by the needs of commerce, present or prospective, and which we believe will pay largely for every dollar invested. And while we ask this for our rivers, harbors and other waters from the Potomac to the St.

Johns, the Apalachicola to the Rio Grande, and for the Ohio, Missouri and Mississippi, with their splendid tributaries, we ask the same treatment for the rivers of New England, the Central States and Great Lakes section, for the upper Mississippi and Missouri regions, for the great Columbia of the West and its main affluent, the Snake; for the Sacramento and San Joaquin, and everywhere else in our Republic. Wherever a worthy water course exists, we ask for it fair, just, liberal and business-like treatment, to the end that greater facilities may be furnished the nation for moving freight and transportation rates may be regulated and cheapened.

## Opportunity for the South in the Opening of the Panama Canal

By JOHN O. COLLINS, Ancon, Canal Zone.



UICK communication by water without the present trans-shipment of cargo between the South and the Orient, and the west coast of Central and South America.

Quick communication by water with the west coast of the United States and Canada.

The development of transportation routes direct between points of the South and those of the whole world.

The possibility of cheaper rates of carriage between the points of the South and those of the west coast of the United States.

These are the chief advantages that the opening of the Panama Canal will place within reach of the southern part of the United States. More than any other part of the country, this section will be benefited, provided it wishes to take advantage of the opportunities.

But I wish to emphasize from the beginning that the Panama Canal will be of benefit to the Southern shipper and to the South only if means are taken at once to insure sufficient number of ships to carry the freight offered and to procure proper rates.

Without going into details as to the work of building the canal, it is pertinent to say that preparations for its use should be made at once (as they are being made by many persons), for the present state of the work seems to assure the opening of the waterway to commerce early in 1914. Concrete work on the locks will be finished by June 1, 1913; Gatun Dam is already practically finished, and 50 feet of water is backed up in Gatun Lake. It is believed that the excavation in Culebra Cut will be so far advanced by July, 1913, that the canal may be flooded and the great ladder dredge *Corozal* taken through the Pacific locks to the cut to finish what little digging remains.

Only one factor is in doubt, and that the erection of machinery to operate the locks. Colonel Goethals assured Secretary of War Stimson in November that all this work would be done within the year. It is not too much to expect that the canal will be open to commerce in January or February, 1914.

On January 1, 1913, the excavation was within 26,000,000 cubic yards, 12 per cent., of completion; the lock work was 93 per cent. completed, and the terminal work was over 50 per cent. done.

At both entrances of the canal wharves and piers of concrete are being constructed to handle the trans-shipment trade. At both places there are quay walls, and a series of piers, capable of docking ships 1000 feet long. The work now in progress at the Atlantic entrance provides for 5000 feet of new concrete piers and quays, making in all about 10,000 feet of dock space. This can be added to indefinitely by building new piers. At the Pacific entrance the dock space being provided is 5000 feet in addition to 1500 feet of pier already in use. The piers at both entrances will be covered, and adjacent to them will be warehouses.

Repair facilities include a shipyard for use of the navy, which may also be used by commercial vessels. This yard is at the Pacific entrance, and includes a graving dock for vessels 1000 feet long, and a large machine shop. Any repairs can be handled at this yard. At the Atlantic entrance the present dry-dock, 300 feet long, and the machine shop adjacent to it, will be retained in service for light repairs.

Two coal storage piles will be maintained for the navy, and the coal will also be sold to merchantmen. The pile at the Pacific entrance will contain 100,000 tons and that at the Atlantic entrance 200,000 tons, with capacity for 50 per cent. more. It is believed that the coal will be sold for \$5 a ton. This will make it impossible for private interests to control the price at Panama. On the other hand, the Government will not monopolize the business, and any private interests that may wish to do so will be at liberty to establish coaling plants. The Government plants will lift coal from the piles directly into the holds of vessels.

Already the Union Oil Co. of California maintains an oil plant on the Isthmus, with tanks at various points along the canal supplied by an eight-inch pipe line that carries oil from the pumping plant at Balboa to Cristobal. In addition, the Government will have storage tanks at both entrances, and the Standard Oil Co. is now preparing to establish an oil plant. An oil company has been formed to develop the fields of Ecuador, near Guayaquil, and the Royal Mail Steam Packet Co. has agreed to take oil for all its fleet if the new company can furnish it.

No plans have yet been elaborated for revictualling ships at Panama. The Government will maintain its present cold-storage plant with a capacity of 100 tons daily, but proposed abattoirs and merchandising stores are still in the fancy stage.

Inasmuch as the Government has provided indemnity for ships damaged in passing through the locks, and as the balance of the canal is from 300 to 1000

feet wide, it is believed that insurance companies will grant regular rates to ships using the canal.

### DISTANCE AS AN ELEMENT IN THE USE OF THE CANAL.

Although seemingly the most elemental consideration in the use of the canal, the comparative distances between ports by way of Panama and other competing routes is really of less importance than the cost of tolls or the cost of fuel. This is because the Panama route will have a monopoly of the trade between Europe and eastern ports of the United States with ports of South America north of Valparaiso, and all Pacific coast ports of North America. On the other hand, the advantage of distance for all Australasian ports and Asiatic ports west of Singapore is greatly in favor of the Suez route, so far as European competition is concerned. The only competitive territory, therefore, is that which includes New Zealand, Japan and Eastern China. The Panama route will be a competitor for this trade, if the cost of tolls and fuel is sufficiently low to make it attractive for European vessels to take cargo for only far eastern ports, giving up the trade between various ports en route to the Orient. The following tables show the relative distances from leading ports of the South and from Liverpool and New York to ports in the competitive territory by the Panama and Suez routes:

#### Comparative Distances—Liverpool, New York, New Orleans and Charleston to Oriental Ports by Way of Panama and Suez.

To	From Liverpool.		From New York.	
	Via Suez.	Via Panama.	Via Suez.	Via Panama.
	Miles.	Miles.	Miles.	Miles.
Sydney .....	12,235	12,385	(1)	9,811
Wellington .....	12,989	11,425	(2)	8,851
Manila .....	9,701	14,122	11,598	11,548
Hongkong .....	9,785	13,957	11,673	11,691
Yokohama .....	11,678	12,372	13,566	9,798

(1) Via Cape of Good Hope, 13,658 miles.

(2) Via Cape of Good Hope, 14,441 miles.

To	From New Orleans.		From Charleston.	
	(1)	(2)	Via Suez.	Via Panama.
	Via Suez.	Via Panama.	Miles.	Miles.
	Miles.	Miles.		
Sydney .....	14,676 (3)	9,232	13,939 (3)	9,401
Wellington .....	(4)	8,272	(5)	8,441
Manila .....	12,947	10,969	11,986	11,138
Hongkong .....	13,031	11,112	12,070	11,281
Yokohama .....	14,924	9,219	13,963	9,388

(1)

(2) Via Panama, San Francisco and Yokohama.

(3) Via Cape of Good Hope.

(4) Via Cape of Good Hope, 15,374 miles; via Magellan, 11,760 miles.

(5) Via Cape of Good Hope, 14,637 miles; via Strait of Magellan, 11,295.

A comparison of distances from New York and Liverpool and various ports in the southern part of the United States to ports on the west coast of the Americas follows:

#### Distances from Various Ports of the United States and from Liverpool to West Coast Ports of the Americas and to Honolulu via the Panama Canal.

From	To							
	Panama.	San Francisco.	Puget Sound, Port Townsend.	Callao.	Guayaquil.	Iquique.	Valparaiso.	Honolulu.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Liverpool.....	4,591	7,836	8,606	5,937	5,384	6,578	7,207	9,276
New York.....	2,017	5,262	6,032	3,363	2,810	4,004	4,633	6,702
Baltimore.....	1,944	5,189	5,959	3,290	2,737	3,931	4,560	6,629
Norfolk.....	1,822	5,067	5,837	3,168	2,615	3,809	4,438	6,507
Charleston.....	1,607	4,852	5,622	2,953	2,400	3,594	4,223	6,292
Savannah.....	1,606	4,851	5,621	2,952	2,399	3,593	4,222	6,291
Key West.....	1,100	4,345	5,115	2,446	1,893	3,087	3,716	5,785
Tampa.....	1,260	4,505	5,275	2,606	2,053	3,247	3,876	5,945
Pensacola.....	1,392	4,637	5,407	2,738	2,185	3,379	4,008	6,077
Mobile.....	1,419	4,664	5,434	2,765	2,212	3,406	4,035	6,104
New Orleans....	1,438	4,683	5,453	2,784	2,231	3,425	4,054	6,123
Sabine City....	1,394	4,639	5,409	2,740	2,187	3,381	4,010	6,079
Galveston.....	1,542	4,787	5,557	2,888	2,335	3,529	4,158	6,227
Jacksonville....	1,553	4,804	5,574	2,905	2,352	3,546	4,175	6,244

To get distance to Acapulco add 1,426 miles to Panama; to San Jose de Guatemala, 886 miles to Panama.

Eliminating the competitive territory referred to, the Panama route will have a monopoly of all the balance of the world trade seeking the west coast



of the Americas and the islands of the Pacific. The ports of the United States will have a great advantage of distance in this trade, and those of the southern part of the United States the greatest advantage. This fact was never absent from the mind of the late Senator John T. Morgan, for although he was an advocate of an Isthmian canal on general principles of patriotism, he saw in it an especial boon for his own part of the United States.

#### TERRITORY IN PANAMA SPHERE.

Three distinct portions of the world are brought nearer to the South by the use of the Panama route—that part of Asia east of Singapore, Australasia and the west coast of the Americas, including the islands of the Pacific.

*Asia.*—The trade of Asia east of Singapore in 1910 amounted to \$1,308,880,000 in value, and of this amount the United States' trade was \$83,680,000, a small portion, but the increase in United States' trade with this section was much greater during the decade than that of European countries. All of this territory is brought nearer the Atlantic and Gulf ports of the United States by the use of the canal, the actual saving in distance alone over the Suez route, which is now followed, being so great as to be a determining factor in shipping direct from the United States via Panama. This saving is most appreciable in the case of Southern ports. For instance, the distance is about the same by either route from New York to Manila and Hongkong, while there is a saving from New Orleans via Panama of 1978 and 1919 miles, respectively. The saving for New Orleans via Panama to Yokohama is 5705 miles, and to Shanghai 3813 miles.

*Australasia and New Zealand.*—The trade of Australasia in 1909 amounted to \$550,000,000, and that of New Zealand to \$175,000,000, the United States' share of the total being \$47,000,000. At present this trade between the Atlantic and Gulf ports of the United States goes via Cape of Good Hope, but upon the opening of the canal it will go by Panama, for here also the saving in distance is so great as to make any other route out of the question. The saving from Norfolk and New Orleans to the chief ports is as follows:

Miles Saved by Use of Panama Canal as Compared with Cape of Good Hope Route to Australasia.

To	From Norfolk. Miles Saved.	From New Orleans. Miles Saved.
Adelaide.....	1,550	3,258
Melbourne.....	2,570	4,282
Sydney.....	3,730	5,444
Wellington.....	2,300	3,488

*West Coast of the Americas.*—All the west coast of North and South America is brought nearer to the eastern ports of the United States by the Panama route, the distances saved over all water routes from Norfolk and New Orleans being as follows:

Miles Saved Over All Water Routes by Use of Panama Canal Between Southern Ports and West Coast Ports.

To	From Norfolk. Miles Saved.	From New Orleans. Miles Saved.
Sitka.....	8,020	8,868
Port Townsend.....	8,020	8,868
San Francisco.....	8,020	8,868
Acapulco.....	8,228	9,076
Callao.....	6,397	7,245
Valparaiso.....	3,894	4,724

The trade of this section is impossible to determine with its relation to the Panama Canal, because it includes a vast volume between the eastern part of the United States and the western part that is now carried by rail. The saving in distance, compared with other all water routes, is decisive, and the result will undoubtedly be to promote a direct carrying system between Atlantic and Gulf ports with all parts of the west coast. Southern products can be laid down in west coast ports at less price than those from other ports of the United States, simply because of geographical position with relation to the canal, giving the South an advantage in the matter of freight charges.

In the matter of the trade between eastern and southern ports of the United States with Pacific ports, the canal will be a disappointment, however, if the present status is not changed.

#### RETURN CARGO.

Although the trade of the South with the countries within the sphere of influence of the Panama Canal will naturally increase with the decrease in transportation rates to those countries, its extension is complicated with the question of what these countries have to offer in exchange. "Return Cargo" is the most difficult problem that ocean carriers have to solve.

No better answer to the question, "What Has the South to Sell," can be offered than the Manufacturers Record of February 22, 1912—"Thirty Years of Southern Upbuilding." The exports in 1911 from the Southern ports of the United States were valued at \$747,822,000, and it is probable that at least three hundred million worth of Southern products were exported through Northern ports. The imports amounted to only \$157,311,000, although here again the figures are misleading, because a large amount of commodities was imported into the South through Northern ports. Yet it is probable that the exports of the South are twice as great in value as the imports.

This is important as bearing upon the establishment of steamship lines direct between Southern ports and countries in the Panama sphere. Unless there is a rapid change in the relative amounts of imports and exports, it is not likely that the full benefits of cheaper freight rates will be enjoyed by the South within the next decade. The gradual upbuilding of a direct trade with the Orient and the west coast of the Americas, due to the establishment of industries that can use the products of those regions, and to an increase in the standards of living, will eventually accomplish the desired balance in trade.

#### THE ORIENTAL MARKET.

Cotton and cotton goods, steel and its products, and sugar are the principal imports of Japan and China.

As the cotton mill industry increases in Japan, where there are already over two million spindles, the demand for raw cotton increases, and the market for cotton goods becomes more contracted. In 1910 Japanese mills used 1,028,000 bales, and the purchases were made from China, India, Egypt and the United States. Indian cotton is generally short staple, and the product is used largely in the Indian mills. China exports a small amount of cotton and imports none. The cotton goods industry is small in that country, there being only 765,000 spindles, but it is a steadily growing industry. China, the Philippines and the East Indies are the most attractive market in the Orient for cotton goods of low grade. The mass of the people are living on low standards, and the quality of goods sold to them is correspondingly low.

Neither China nor Japan supplies its own wants in iron and steel, and the Japanese mills, about which so much talk has been made, are largely run at a loss. The development of China as foreshadowed by the political revolution and the construction of railways is sure to increase the market for steel products of all kinds, while Japan will probably import most of its iron goods for a generation to come. The ideal cargo, cotton and iron, can therefore be carried to the Orient. In addition, sugar from Cuba may form a profitable export, because both China and Japan import sugar, although the total quantity is only one billion pounds, about one-fourth the total import of the United States. It is not likely that the grain and flour trade, that is sure to develop at the mouth of the Mississippi, will ever affect the shipments to the Orient. British India, Australia, Russia and Canada, all nearer to China and Japan than New Orleans will be, are exporting wheat and other grains.

At present the trade in cotton and iron with China and Japan is carried on largely through the Suez Canal, although small shipments are made from San Francisco. With the opening of the canal the all-water route from Charleston to Japan will be shortened 4500 miles, and from Galveston to Japan 5700 miles.

A return cargo from China, Japan and the East Indies will not be easy to accumulate, because the articles exported from the Orient do not make bulk. China sells wool, matting, silks, porcelain of various kinds, a dainty fabric known as Canton linen, tea, and all that variety of bric-a-brac known as "Chinese goods." Japan sells finer porcelain, silks, tea and a line of daintily worked ornaments. In the great staples these countries do not produce enough to support themselves. This is true in less degree of the East Indies, where precious woods, spices, coffee, tin and fiber form important exports.

#### LATIN AMERICA.

There is little manufacturing in Latin America, and all manufactured goods find a market there. Furthermore, the people of tropical countries are heavy importers of foodstuffs, simply because they are too lazy to farm intelligently. Yet the standard of living is low, and, therefore, the market is not so great as the population would indicate.

Great natural resources remain untouched in all of the west coast countries of South and Central America, and therefore it is possible to sell coal in Chile and Peru; cotton goods in Peru, which actually exports cotton; furniture all along the coast where the mountains are rich in hardwoods; foodstuffs to people living on more fertile lands than those from which the American reaps his wheat. There is a big coal field in Southern Chile, but the grade is inferior and most of the coal now used on the west coast is brought from Australia and New Zealand by ships that carry nitrate to Europe. The ruling price for coal equal to Pocohontas is \$9 a ton. At this price it would form a lucrative trade as soon as the canal is opened, for coal can be laid down at Panama from Norfolk at \$4 a ton.

The best feature of the Chile trade is that nitrate can be brought back, and thus a ship need never want return cargo. This is an especially inviting trade for the South, because the great phosphate industry of Florida, Tennessee and South Carolina requires large quantities of nitrate. About two million tons are exported from Chile each year.

Other products that would enter into return cargoes from the west coast of South and Central America are skins and hides from Ecuador and Peru, precious woods from all countries between Nicaragua and Chile, copper from Peru, wild rubber, cocoanuts, bananas and fruits from the tropical countries.

#### WEST COAST OF THE UNITED STATES.

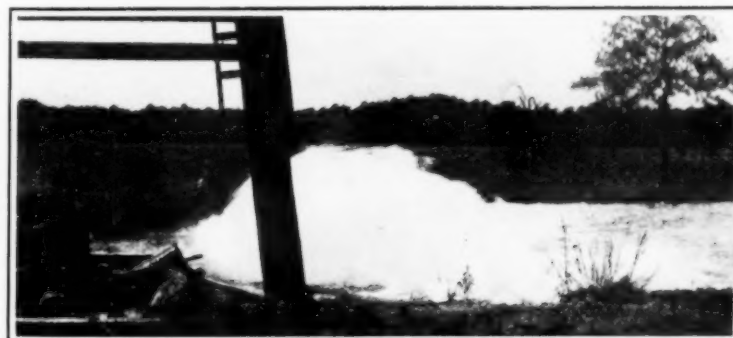
It is not likely that any distinctly new trade will develop with the Pacific Coast States in consequence of the opening of the canal, but all the present trade will be greatly expanded, if proper care is taken to insure low freight rates.

# Industrial Energy in Waters of the South



HOW HYDRO-ELECTRIC POWER IS DEVELOPED FROM SOUTHERN STREAMS.

## IRRIGATION AND ITS EFFECTS



FLOWING WELL IRRIGATING RICE.



ALFALFA RAISED ON IRRIGATED LAND.



DISTRIBUTING WATER ON PRAIRIE LAND.





VIEW OF A STOCK FARM



PART OF A FLOCK OF 6700 SHEEP



GROUP OF PERCHERON HORSES

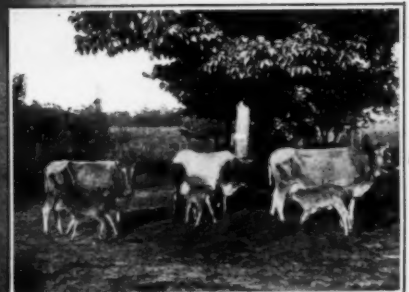


A HERD OF JERSEYS

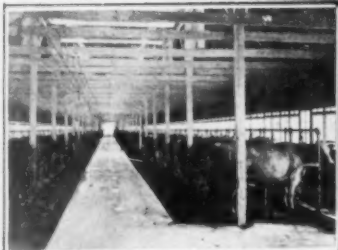


SILO-FED RED POLLS

# Horses Cattle and Poultry



DAIRY COWS



A MODEL DAIRY



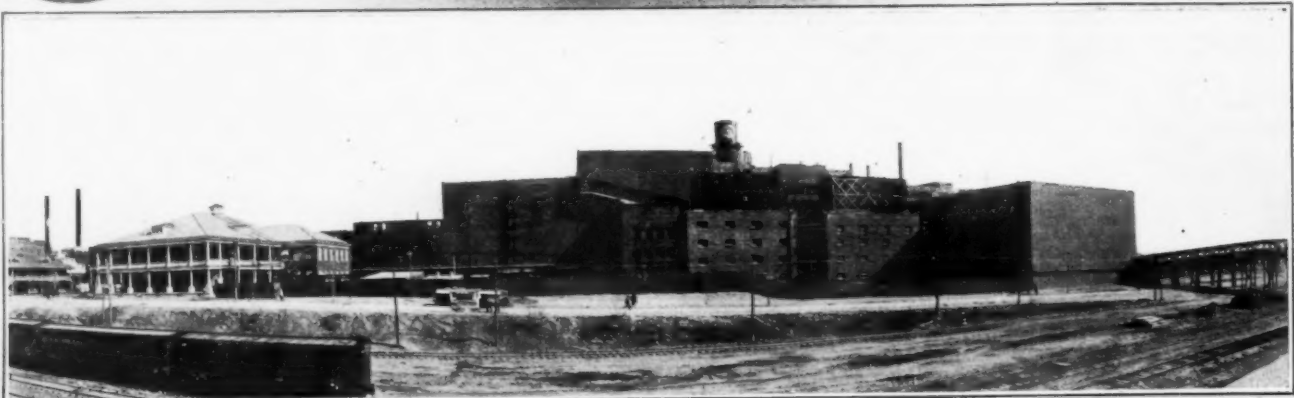
BERKSHIRE HOGS



FEEDING THE CHICKENS



SADDLERY &amp; HARNESS WORKS



A MEAT PACKING PLANT

# The Appalachian National Forest as Affecting the South's Future

By JOHN H. FINNEY, Secretary and Treasurer Appalachian National Forest Association.



WHEN President Taft signed, on March 1, 1911, the Weeks Forestry Bill, so called after its author, the Hon. John W. Weeks of Massachusetts, the untiring efforts of those who had fought for this legislation for a decade and a half saw their successful termination; there was put into effect thereby what many deem the best and most far-reaching piece of constructive legislation enacted by the Congress in many years, and one of large importance to the South from many and varied standpoints.

It is fitting that proper tribute should here be paid to men and women of the South and New England, and indeed throughout the nation, who of their time and thought and effort contributed to the final outcome during the long

the South, it being a conspicuous fact that no Southern State except Maryland has met the necessary requirements for securing this Federal aid; the terms are simple and direct—they require for this co-operation that the State shall have established a fire protection system satisfactory to the Department of Agriculture; that it shall appropriate an amount of money equal to that contributed under the Weeks law, and that private owners shall also co-operate, any fund furnished by them not to be considered part of the State appropriation. In no case, however, does the Federal Government contribute more than \$10,000 to one State in any one year. Up to the present time all the New England States, New York, New Jersey, Maryland, Wisconsin, Minnesota, Oregon and Washington have taken advantage of this opportunity to



A TYPICAL HARDWOOD FOREST IN GRAHAM COUNTY, N. C.  
One kind of land which is being purchased by the Federal Government.



THE NOONTOOTLY RIVER VALLEY IN GEORGIA,  
Which will probably become a part of the Appalachian Forest Reserve.



THINLY FORESTED KNOLLS IN MACON COUNTY, N. C.,  
Where a forest should be perpetually maintained.



NON-AGRICULTURAL LAND ALONG THE CHEAT RIVER, W. VA.,  
Controlling the stream flow of the navigable river.

and oftentimes discouraging fight for national sanity in dealing with the forest question—a fight in which national engineering societies, scientific bodies, boards of trade, chambers of commerce, forestry associations, women's clubs, public-spirited men and women from all walks of life, were enlisted for many years. The result is striking testimony to their patriotism and devotion, and to the force of public opinion rightly exerted.

The Weeks Forestry Bill, while national in its scope and thus applicable to any part of the country, was designed primarily to remedy the appalling forestry conditions in the Southern Appalachians and in the White Mountain region in New England. It created a National Forest Reservation Commission and authorized the acquisition by purchase of lands on the watersheds of navigable streams for the purpose of conserving their navigability. The general purpose of the law is to secure the maintenance by the Federal Government of a perpetual growth of forests on the watersheds of navigable streams where such growth will materially aid in flood prevention, in improving low waters due to checking the run off, in preventing erosion of steep slopes and the silting up of the river channels, thereby improving the supply and flow of water for navigation.

The Weeks bill provided, in addition to its appropriations for the purchase of lands, later referred to in detail, the additional sum of \$200,000 to enable the Secretary of Agriculture to co-operate with States in protecting forested watersheds of navigable streams from fires. This important work of co-operation in cutting down the enormous fire loss is strikingly disregarded in

obtain Federal aid and are finding it possible under the improved conditions to almost wholly prevent disastrous and destructive forest fires within their borders. During the calendar year 1911 \$38,793 were expended in State co-operation, and for the calendar year 1912 \$77,500 were allotted. On September 1, 1912, \$83,706.43 were still available for this work.

Consideration of the Weeks measure in its specific terms shows that the act, as passed, appropriates \$11,000,000 for the examination, survey and acquirement of lands, \$1,000,000 to be available during the fiscal year 1910, and not to exceed \$2,000,000 for each fiscal year thereafter until June 30, 1915. Since the law was not passed until March 1, 1911, the \$1,000,000 appropriated for the fiscal year 1910 was entirely unavailable. Furthermore, because of the preliminary work necessary in preparing for the acquisition of land, but a small part of \$2,000,000 available in 1911 could be expended. During the last session of Congress a law was passed making available until expended the \$8,000,000 which had been set aside for the fiscal years 1912, 1913, 1914 and 1915. Of this amount, between \$100,000 and \$150,000 a year will be needed to be set aside for expenses incident to examinations, surveys, title work, etc.

Prior to the passage of the Act of March 1, 1911, the Forest Service had conducted extensive investigations concerning forest conditions in the Southern Appalachians and the important relations existing in that region between forest cover and flow of navigable rivers, so that a general knowledge of where national forests should be located to protect navigation was already at hand. In these earlier investigations it was found that of the 23,000,000 acres



of non-agricultural land in the Southern Appalachians it would be desirable to convert about 5,000,000 into national forests, and that in the White Mountains about 600,000 acres of national forests were needed. It is the aim of those in charge of the work to purchase 1,000,000 acres or more of these lands with the \$8,000,000 available. Since the present fund will be insufficient to purchase all the land desired, there is a special need that the areas purchased shall be selected with the utmost care, so that the maximum amount of benefit to navigable rivers can be obtained at the minimum expenditure of available funds. The lands acquired will be situated in solid blocks of 25,000 acres or more, and these will be scattered here and there with reference to their effect upon the flow of navigable rivers. As soon as the Weeks Bill became a law twelve areas were designated in the Southern Appalachians in which it was desired that land be purchased. Five new purchase areas were designated during the fiscal year 1912. There are now eighteen of these purchase areas situated in Virginia, West Virginia, North Carolina, South Carolina, Tennessee, Georgia and New Hampshire, with a total area of over 6,383,000 acres. For the present purchases will be confined to these areas. These purchase areas are as follows:

Location and Acreage.			
Name.	State.	Acres.	Total Acres.
Boone .....	North Carolina.....	241,462	241,462
Cherokee .....	Tennessee.....	222,058	222,058
	Georgia.....	459,161	
	North Carolina.....	16,738	475,899
Massanutten .....	Virginia.....	152,946	152,946
Monongahela .....	West Virginia.....	682,316	682,316
Mount Mitchell.....	North Carolina.....	214,922	214,922
Nantahala .....	Georgia.....	2,193	
	North Carolina.....	589,720	591,913
Natural Bridge.....	Virginia.....	106,564	106,564
Pisgah .....	North Carolina.....	358,577	358,577
Potomac .....	Virginia.....	59,556	
	West Virginia.....	79,433	138,989
Savannah .....	Georgia.....	89,172	
	North Carolina.....	159,040	
	South Carolina.....	142,949	391,161
Shenandoah .....	Virginia.....	301,940	
	West Virginia.....	76,991	378,931
Smoky Mountains.....	North Carolina.....	339,701	
	Tennessee.....	353,201	692,902
Unaka .....	North Carolina.....	169,377	
	Tennessee.....	304,156	473,533
White Mountains.....	Maine.....	7,910	
	New Hampshire.....	659,090	667,000
White Top.....	Tennessee.....	132,986	
	Virginia.....	186,639	319,625
Yadkin .....	North Carolina.....	194,496	194,496
Youghiogheny .....	Maryland.....	80,259	80,259
Total .....			6,383,553

As required by the law, the United States Geological Survey is examining these purchase areas to determine whether or not the forest cover exercises a beneficial influence in regulating the flow of navigable streams. Two considerations enter into this determination: (1) the effect of the forest cover in preventing erosion of soil and the consequent filling up of the stream beds of navigable rivers, which causes the carrying capacity of the river beds to be lessened, and hence the overflow of the rivers during periods when the supply of water is large, and (2) the effect of the forest cover in the direct regulation of runoff. The investigations of the survey in the Southern Appalachians resulted in finding that the forest cover in the areas under consideration had a very pronounced effect upon erosion, and all the lands recommended by the Forest Service for purchase are in localities which have been approved by the Geological Survey. In the White Mountain area the erosion of deforested slopes was not found to be pronounced enough to justify the purchase of lands on this basis, and the question of the effect of runoff was, therefore, taken under consideration. Thorough investigation of this question was made through measurements taken upon a series of similar watersheds, some bearing heavy forest cover and others being sparsely protected or barren. The results of these investigations were held to justify conclusively the acquirement of the lands in that region by the Government. No unfavorable reports have been received from the Geological Survey. During the fiscal year 1911 the Survey examined and reported favorably upon 92,955 acres, and during 1912 upon 2,536,845 acres, making a total of 2,629,800 acres.

The Forest Service has been designated to receive proposals of lands submitted for purchase and to examine and place valuation upon these lands. From April 1, 1911, to June 30, 1912, proposals were received covering 2,531,316 acres of land in the White Mountains and the Southern Appalachians. Of these lands, 2,102,330 acres were within the general areas which have been selected for purchase. During the same period 840,543 acres were examined and 287,698 acres were submitted to and approved by the National Forest Reservation Commission, whose duty it is to pass upon (1) whether the land submitted by the Forest Service is desirable for purchase for the protection of stream flow of navigable rivers, and (2) what price should be paid for the land. The lands approved by the commission are located as follows:

Georgia area, 31,876 acres, in Fannin, Union, Gilmer and Lumpkin counties, Georgia.

Massanutten area, 19,322 acres, in Page and Rockingham counties, Va.

Mt. Mitchell area, 18,701 acres, in McDowell county, N. C.

Nantahala area, 27,815 acres, in Macon and Swain counties, N. C.  
Natural Bridge area, 24,900 acres, in Rockbridge, Bedford and Botetourt counties, Va.

Smoky Mountain area, 59,213 acres, in Blount and Sevier counties, Tenn.

White Mountain area, 72,252 acres, in Coos and Grafton counties, N. H.

White Top area, 33,619 acres, in Johnson and Sullivan counties, Tenn., and Washington county, Va.

When tracts have been approved for purchase the land must be surveyed and the tract then paid for on the acreage basis. Surveys are required to be made by horizontal measurement, in accordance with the practice followed in the public land surveys. It has been found in most cases that the horizontal survey reduces the estimate of the land contained in the purchase tracts. Up to this time title to 8113 acres has actually passed to the United States. This land is situated in McDowell county, N. C. On June 30, 1912, 257,228 acres were under contract or condemnation proceedings. Most of the land which has been acquired or is under contract or condemnation is land which has been cut over or culled of its best material, though some virgin timber has also been acquired. The average price paid per acre up to June 30, 1912, was \$5.95. The lowest price paid per acre up to that time was \$1.16, which was paid for land which has been cut over and burned and which has small reproductive capacity. The highest price paid was \$15, which was for a valuable tract of virgin spruce in the Great Smoky Mountains.

The land acquired by the Government is promptly placed under administration and protection, in accordance with the same practices as those followed on the national forests in other parts of the country. It is not necessary for the Government even to wait until complete title has passed before establishing administration. The work can be undertaken as soon as the land is placed under contract or condemnation. Congress, at its last session, appropriated \$32,000 for the protection and administration of lands being acquired. Additional appropriations to cover other lands acquired are expected to be made available as needed.

The Weeks bill expires by limitation, it will be noted, in 1915, when there will have been purchased, if the present plans of the National Forest Commission are carried out, something approximating one million acres in the purchase areas selected, and located in the South and in New England. It therefore becomes necessary to look into the future somewhat if we of the South are to save to the South and to the nation what the writer believes to be the South's greatest asset, her forests.

Is not this last statement absolutely true? Look into the facts—the South contains approximately half of the nation's remaining timber, and by far the most valuable species; it has, for instance, all the long leaf pine, all the cypress, nearly all the hardwood, and in addition the Appalachian region is the only natural home of the hardwoods and the only possible source of its future supply. It is of grave concern, therefore, how this nationally important Southern forest problem shall be handled in the future—how the present indifference and neglect of the South shall be cured and changed into aggressive action for forest perpetuation.

While the improvement of the flow and control of the water for navigation is the fundamental purpose of the Weeks bill, other benefits incidental in character, but nevertheless important, are within the scope and are a part of its purpose. Among these are (1) protection against destruction of the soil and soil cover by forest fires; (2) preservation of water-powers, since like navigation they depend for their value on evenness of stream flow; (3) preservation of the purity and regularity of flow of mountain streams with a view to their necessary use for the water supply of cities and towns; (4) preservation of the beauty and attractiveness of the upland regions for the recreation and pleasure of the people; (5) perpetuation in part of a timber supply to meet the growing needs of the country's industries; (6) as a striking example of "conservation through wise use" of this important national asset, that shall through national leadership, compel the States themselves to take prompt steps to better their forest conditions.

The vast importance of these general purposes of this forestry legislation merits more than casual consideration. The work thus undertaken by the Federal Government obviously benefits and is of deep concern to every interest in the South—farmers, manufacturers, railroads, communities, and all others—but quite as obviously is only a part of the work required to be done, which absolutely must be done if the forests are saved. It is well to make here a clear distinction between (1) these lands now temporarily occupied by forests and more valuable for agriculture than for any forest purpose, and which must eventually be almost wholly cleared of forest and used ultimately for agriculture, and (2) those lands which are purely forest lands, either now growing timber or suitable therefor, and suitable for nothing else—lands when once denuded, fire swept and eroded become barren and desolate wastes, and remain so forever.

Of the lands in the first class we can do little more than to conserve through wise use and scientific care and cutting, and protection from fire, that shall extend their life and usefulness until the time when the growing needs of agriculture shall demand other use for the soil; of the lands in the second class we can do vastly more, because here we can through wise use, protection from fire, replanting, proper lumbering methods, etc., insure not only a profitable and perpetual timber crop, but secure it from lands having no other value than as a timber farm—lands that without a timber growth are barren wastes. Both classes herein enumerated require at least two things in common: wise use and protection from fire, and both these two things are lacking to an astonishing degree throughout the whole South. As an example we need only cite our crude turpentine methods, and our universal neglect in providing an efficient fire protective system, even when the aid of the Federal Government is tendered. So neglectful are we in this matter of fire protection that while the annual loss in the South is known to be very large and oftentimes appalling in money and lives, no records are available that permit more than an approximation of its extent and damage.

The purely forest lands located as they are above the coastal plains and

mainly on the steep slopes of the mountain range, apart from their timber value and productive capacity when farmed for timber, serve, it will be noted, to preserve water-power since they serve as nature's reservoirs in conserving rainfall, and thus even the runoff—the nine million or more horsepower of the streams of the South capable of commercial development, which, when developed, shall enormously add to the South's commercial and industrial importance, and which even now is a large factor in the upbuilding of the South—depends almost wholly upon the forest cover at the headwaters of our mountain streams.

These same streams are in many cases the source of the water supply of our cities and towns—is it not even now a source of deep concern that their purity and regularity of flow should be preserved—is it not absolutely necessary that their purity should be strictly safeguarded for the future when the South shall have come into her own and shall have quadrupled her present population? And if to this necessary function of the forest, which only the forest can give, we add the beauty and attractiveness of the mountain region as breathing places, as a sanitarium for tired nerves, as recreation grounds for the pleasure of a whole nation—which again only the forest can give—our concern must grow when we consider that we have in these upland regions 23,000,000 acres of such important lands, and that only 1,000,000 acres are to be taken care of by the Federal Government.

What of the other 22,000,000 acres of such lands? What of the over 200,000,000 acres of true forest lands throughout the South?

Herein comes, I believe, the largest value of the Weeks bill, namely, its example to the South and its national leadership in the grave forest problems. It becomes an example of what should be and how it should be done. With forest reservations scattered throughout the South we shall have striking object-lessons in sanity in dealing with our forest lands that must inevitably bring about a saner local treatment of this great resource. The States must themselves purchase and maintain State forests—the States themselves must protect them and all forest areas within their borders against fires; the States themselves must, if need be, regulate their cut and their proper handling—the Southern States must get together on the forest problems, dealing with them in a uniform way throughout the whole South, if this great Southern, nay national, asset shall be put to its highest use.

Only the States can do it, and if this great forest area that today is in serious jeopardy is to be saved to the South, as it can and must be if the South is to remain a fair and smiling land, the "Nation's Greatest Asset," in truth, the South itself must do it, and do it promptly.

I believe that when the facts are fully realized there will be throughout the whole South such an awakening to the evils that indifference and neglect are bringing upon us that the forest problem will be seriously undertaken and its proper and right solution found, for therein lies in large measure the future of the South.

## Two Crops a Year on the Same Land

### Wide Range of Products in the South Unmatched Elsewhere

By N. L. WILLETT, Augusta, Ga.



HE South's chief asset is her agriculture; therefore, as the South is the nation's best asset, how important a matter becomes Southern agriculture and how important it is that the possibilities of agriculture in the South be exploited before the world.

How slow does agriculture travel? In point of fact, how little does the farmer making 17 bushels of wheat per acre under a one crop per annum system in the Northwest Canada lands know of the crop types and seasons and crop outturns of the South? Perhaps the farmers of New England, the Middle or Northwest, likewise know as little of these things as their Canada brother.

The South is widely known as the land of cotton. But it is not equally known that it is also pre-eminently the land of forage and hay plants and therefore a coming cattle country, the land of the legumes, the land of two crops per annum, which make for the farmer double profit. It is the great trucking land of America. It is a land well watered by streams, with ample annual rainfall, and a goodly portion of it has also as an interesting available asset overflowing artesian wells. It is the habitat of many varieties of economic plants practically unknown and unavailable for use in the North. And lastly, it is the best habitat or the place of best development for many well-known and widely distributed plant types.

Plants vary according to habitat. Seedsmen always go for seed stock of every given type wherever that type's best development is found. On similar lines it should interest the farmer who is growing crops that are in quality subnormal or minus to know, if it be a fact, that these crops have a better development in the South.

The corn of the West and Middle West rarely ripens to absolute completeness. It has large water content—sometimes 15 or 20 per cent. It easily heats and ferments, and is dangerous as a feed. Every year in the South thousands of horses and mules are killed by colic through eating Western corn—used because it is so cheap. Southern-grown corn is fully matured, is hard and is safe as a feeding proposition. It always fetches on this account 20 to 25 cents per bushel over Western corn prices. While the hundreds of corn clubs in the South grow 150 to 225 bushels of corn per acre, yet the most ordinary Southern farmer should not be content with less than 40 to 50 bushels.

The oats of the Middle West and West are spring grown, are light in weight and chaffy. The fall and winter sown Appler rust-proof oats of the South are 50 per cent. larger, have less chaff, more meal, and always bring 10 to 15 cents per bushel premium over Western oats. The new Fulghum oats, as large as Appler, but maturing two weeks earlier, and thus giving to the farmer a greater leeway for getting in his second crop, is today the most valuable oat in America. Oat farmers in the South easily grow from 60 to 100 bushels of oats per acre.

The crops of the North as a rule in comparison are more watery, less sweet, and contain less food nutrients. The 6000 carloads of Georgia peaches as shipped per year are sweet and are the highest product in peaches in America; the Delaware, New Jersey and Michigan peaches are watery, green in parts and at the last of the season are tasteless. Alfalfa, as grown now so largely in Mississippi, is higher in nutrients than that of Colorado. The cheap Johnson grass hay of the South contains 50 per cent. more food value than the best Northern timothy. Southern sweet potatoes are so rich in sugar that in baking the syrup runs out and almost covers the jacket. Southern melons are sweeter and are crisp with sugar crystals. The oranges of Florida are far better than the more Northern-grown California oranges. The building woods of the South are heavier, more dense, and will bear more weight and wear longer.

With its two annual crops, with a double profit, the Southern farm is perennially green. There is steady work all the year. One of these crops is

usually some soil-enriching legume. The winter legumes are the two vetches (hairy and English), crimson clover and bur clover. And the summer legumes are cow peas, velvet beans, soy beans, beggar weed and peanuts. No other portion of our country possesses such wealth in legumes as does the South. The value of the legume is that it can be grown on poor soil, and that it makes its own living by assimilating nitrogen from the air and applying it to its own use, and also storing it in the soil for successive crops.

The grains, such as oats, wheat, rye, barley, are sown in the South in the fall, and in spring the land is planted down to some summer legume, or to corn or cotton. Corn and cotton can be followed in the fall by vetch and crimson clover. Three crops, indeed, per annum can be made by planting together in September beardless barley and vetch (sativa in the extreme South, and hairy vetch further North), cut barley late in fall and vetch late in spring, and plant down cow peas, 90-day soy beans, or peanuts, or corn, or cotton. Or beardless barley sown in February will make three cuttings previous to planting time for summer legumes, which are to be followed by the fall grains. Two crops in six months can be made from sweet potatoes—for selling from field, for canning or baking; the second crop is propagated from the vines of the first crop. Irish potatoes make also two crops—the second crop an extremely valuable one and sold in the North in the early fall as fresh Bermudas. Both potato crops can be followed by vetches or grain.

Florida is now shipping so much cattle that a special commissioner for the industry of cattle growing has been appointed. Than the South no portion of our country holds so much promise as a cattle-growing center. The reason is twofold: First, the South's wealth of summer and winter forage crops; and secondly, cattle do not need here winter housing. For hogs in winter there are artichokes, cow peas, velvet beans, chufas, sorghum and North Carolina or Tennessee red peanuts, soy beans, rape—the hogs doing their own gathering in all of these crops. The cow crops are rye, barley, cow peas, beggar weed, pearl millet, German millet, Japanese millet, teosinte, velvet beans, sorghum, kafir corn, milomaze, fodder corn, rape, soy beans, peanuts, Bermuda grass, Johnson grass, bur clover, Japan clover. The best habitat for all of these crops is the South.

The increased acreage in South Georgia and Florida in the past few years in North Carolina peanuts (which do not rot in the ground in the winter) and in velvet beans has been amazing—the latter being used for cattle feeding in general from frost to February 1, and the former being used for hogs.

The farmer and plant lover will find in the South most distinctive and interesting crops, and a wide diversity of crops. The first one is cotton—the South standing, indeed, between the world and nakedness! In a large portion of the South the boll-weevil has driven out the old-time late maturing cottons and put in their place early maturing, or 90-day cottons. The leading types of these as used, and known as short staples of one inch, are Kings, Simpkins and Toole (all medium bolls) and Big Boll Cleveland. Outside of the boll-weevil areas can be grown, in addition to these, upland long staples, such as Allens and Florodora (about one and three-eighths inches), and South Georgia and Florida Sea Island cottons (about one and one-half inches); and the true Sea Island as grown around Charleston and the highest priced cotton in the world, and having a staple of one and three-fourths to two inches. There is grown, too, a new cotton, the Columbia, an early big boll cotton with strong one and one-fourth inch staple, and the almost exact equivalent of Egyptian cotton.

No farm industry so magnificent in size was ever so quickly developed as has been the rice industry of Texas, Louisiana and Oklahoma. It is in the hands mostly of large corporations with great capitalization. The South will soon be a large exporter of this product.

By far the South's greatest leguminous forage plant is the velvet bean.



It makes more hay forage per acre and stores more nitrogen in the soil than any other Southern plant. A good green soiler for all orange and peach orchards, and for Louisiana sugar cane fields. Corn, when planted after velvet beans, is often increased in crop outturn 50 per cent. In three years' time when planted in velvet beans, the sandiest soil can be made to produce one bale of cotton per acre. The piney woodlands of the South, whose stumps are blown up by dynamite and then put into retorts for turpentine, are largely now being put into velvet beans. No other crop is so soil-renewing. Velvet beans grow three feet high and run in all directions 10 or 20 feet. They run even further, if given a support. They have large leaves and long pods, with four beans in each. These pods grow along the vine in bunches that often weigh when green two pounds each. The vine makes good hay when cut green, but the velvet bean's principal use is for cattle grazing. It is planted four feet by four among corn. The corn stalks will give the vine support. Cattle graze from November 1 till February, at which time the stubble is plowed under. All cattle are fond, both of vines and beans. No richer food can be had and its quantity per acre in tons cannot be equaled among all the forage crops in America. It seeds only in the extreme South.

The beggar weed, a legume, grows upright four to six feet in height, and is called the clover of the South. It matures in 80 days and can be cut for hay several times, or pastured late in summer and early fall. It reseeds itself, but can easily be eradicated. It is indigenous to Florida and comes up in all cultivated fields by June 1 just as crab grass does, spreads rapidly, takes possession of the land and comes up each year as a voluntary crop. Large growers of beggar weed as far north as North Carolina have pronounced this to be the best of all leguminous forage and land fertilizing crops in the South Atlantic States. It has high feeding value. Its outturn is about two tons per acre.

Cow peas are the universal hay, fall grazing and soil renovating leguminous crop of the South. Sown alone for hay, it makes one cutting of one and one-half to two and a half tons of hay per acre. The hay brings a very high price. Cow peas largely follow all grain crops. As a second crop, they are sown late in summer in all corn fields for soil renovating, for turning in cattle in fall to feed on and for pea seed gathering. The seed fetch from \$1.25 to \$2.25 per bushel, with an outturn of 15 to 40 bushels per acre. The vine is three to four feet high. There are 40 or more types. The peas known as Clays, Unknowns and Irons are mostly used. The Iron pea is immune to wilt and is the most valuable pea known today. In the latitude of Missouri, the New Era and Whippoorwill peas are used.

The soy bean is an upright legume. As a crop, it closely resembles the cow pea. The beans bring about the same price. The outturn, however, in hay and beans is somewhat greater than that of the cow pea—being about 35 to 50 bushels of beans and two to two and a half tons of hay per acre. Their feeding value, too, is somewhat greater. They are more resistant also to cold, for a 32° frost in spring time will often not kill the vine. A good point, too, is that the vines remain green till about November 1. The planting period is from April 15 to August 1. The grazing period from July 15 to December 1. The variety most used is Mammoth Yellow. The beans are not attacked by weevils, as are cow peas. They are in very large use, especially in North Carolina and Tennessee.

Sugar cane is the great crop of Louisiana. South Georgia, too, grows a good amount, and the syrup of the Georgia cane is a table syrup. It is grown in Georgia in light loamy soil; in Louisiana in heavy, rich lowlands. The Louisiana outturn is about 20 tons of cane per acre, which makes about two tons of sugar with a residuum of molasses worth 8 to 10 cents a gallon, and which goes mostly into cattle feeds—ground alfalfa hay, ground grains, cottonseed meal and molasses. There is too the new Japanese sugar cane, the whole stalk of which is planted and is propagated from the eyes in the joints—the same method of propagation as obtains in the Louisiana sugar cane. The Louisiana cane is an annual, while the Japanese sugar cane lasts from one planting three to eight years. Each joint makes 12 to 20 stools, and 50 to 100 stalks often grow to the bunch. The stalks have about the thickness of your thumb. The syrup is most excellent. It makes a splendid and abundant winter forage, much loved by cattle because of its saccharine qualities. It makes a good combination for cattle grazing with velvet beans. The outturn of Japanese sugar cane is something like 10 to 20 tons of forage per acre. The syrup outturn is 150 to 200 gallons per acre. There is, too, the new Japanese sorghum. This is not propagated from the stalk, but from the seeds. The syrup is thick and bright, and has almost the flavor of ribbon cane syrup. It grows 12 to 14 feet high per stalk, and the stalk is two inches thick at the base. It makes oftentimes as high as 400 gallons of syrup per acre. The ripened stalks, when cut and stacked in the fall, make most excellent feed for cattle.

Peanuts, a legume with 10 or 12 varieties, are increasing in value each year. Immense areas are now being grown in North Carolina, Virginia, Tennessee, Georgia, Florida, Mississippi, Louisiana. They are planted in light, sandy land. They are used in parching and in candies and for peanut butter, etc. The small white Spanish is the favorite variety. The nuts adhere to the roots. The vines, nuts and roots are plowed up in the fields, stored, and when dried the peanuts are removed and the tops go into fine hay. For hog feeding, the never-rotting North Carolina peanut is planted—the hogs in fall and winter doing their own rooting. Sixty to eighty or more bushels per acre is an easy outturn. They can be grown singly as a crop, or can be planted in the corn fields. A valuable hog crop is chufas, known too as grass nuts and ground almonds. Fifty to one hundred bushels are easily made in light, loamy soil. They are as edible as chestnuts. They stool or tiller heavily, making one pint or more of nuts to the hill. Hogs are turned into the field about October 1. Chufas do not rot in the ground.

Jerusalem artichokes are also largely used. They are planted much like Irish potatoes and are very prolific, yielding more than 100 bushels per acre. Planted four feet by four feet, they cover the whole ground. Hogs are turned

in about November 1. If not rooted too closely, a new crop will come up in the succeeding spring.

One of the best-known Southern grasses is Johnson grass, or Means grass. It is grown for hay in large amounts in Mississippi, Texas, Georgia, Florida and Alabama. It is the principal grass, too, in Cuba. It is a large, heavy-growing perennial, well-nigh ineradicable, and therefore in high favor with all grass men. It has a heavy outturn, with three to five cuttings per season, and is 10 per cent. saccharine. It is the standard, cheap, but efficient, hay of the South; a better hay than timothy.

Bermuda grass is the chief perennial grazing and pasture grass of the South. It seeds only in Australia and is propagated in America largely from the roots. These roots, when planted, spread rapidly in every direction, taking root and going down a foot or more every few inches. On rich land it is largely mowed for hay. It is drought resistant and green all the year, save in winter. Of all the grasses in the South, it is perhaps the dairyman's best friend.

Japan clover is a perennial legume which is now scattered all over the South in pastures, woodland, and even in roadways. No other grass is so widely distributed. It makes excellent pasture and reseeds itself. For tall hay-growing purposes, rich lowlands are necessary. It is practically the only hay grass used in Louisiana—making two tons or more to the acre.

Bur clover is a legume, self-perpetuating, that comes up in October and furnishes excellent grazing for cattle all winter. A mixture of bur clover and Bermuda grass gives the farmer or landscape man a hardy perennially green pasture. Land sown to it increases in fertility each year. The usual plan for this crop is to sow it in August in corn fields and graze in winter, or cut for hay in spring and then follow again with corn—the bur clover coming up in subsequent years without further planting.

Artesian water of the purest kind for drinking purposes, from bored wells some 800 feet deep, is available in many portions of the South. This is notably true in nearly the whole of South Georgia. The water is overflowing, in some cases spouting 40 feet and actually propelling machinery. Its temperature is about 66° Fah. Some truckers about Charleston, S. C. (it is largely, too, done in Florida), have made use of artesian water in their business to the end that they have cleared as much as \$3000 an acre in fancy vegetables—making three to four crops per year. They build over their land a system of iron water pipes 8 or 10 feet above the ground and in rows 8 feet apart. The water can be used for irrigation. It can also be turned on in a fine mist or spray in cold weather, which sinks to the ground and keeps the temperature above the danger point. These people grow cucumbers in January with a temperature below freezing. Nearly the whole of the loamy soil of South Georgia could be put to trucking, and this artesian water could be made of great use. The force of the water is sufficient to lift and carry itself wherever needed.

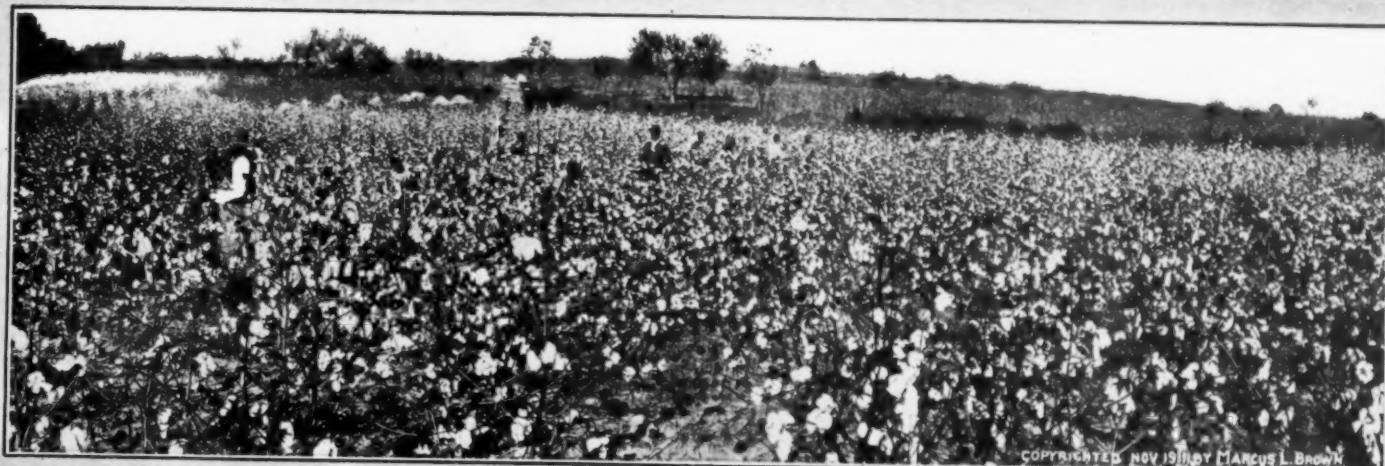
The Southern garden, little or big, is perennially green with a rapid succession of crops. What a vast trucking proposition is Florida! What a wondrous exhibit around Charleston, S. C.! From Charleston, follow it up the coast to Norfolk! Witness it in Texas! Indeed, trucking is indicated wherever in the South a loamy soil is found. About my home, Augusta, Ga., is to be found the greatest asparagus-growing industry in the world.

## The Center of the World and the Focus of the World's Commerce

Matthew F. Maury, the great scientist and "Pathfinder of the Seas," upon whom Europe heaped more honors for scientific attainments than it ever gave to any other American, more than fifty years ago in a report on the importance of an Isthmian Canal and its influence on the Gulf of Mexico, said:

"From all this we are led to the conclusion that the time is rapidly approaching, if it has not already arrived, when the Atlantic and Pacific must join hands across the Isthmus. We have shown that there is no sea in the world which is possessed of such importance as this Southern sea of ours; that, with its succession of harvests, there is from some one or other of its river basins a crop always on the way to market; that it has for back country a continent at the north and another at the south, and a world both to the east and the west. We have shown how it is contiguous to the two first and convenient to them all. The three great outlets of commerce, the delta of the Mississippi, the mouths of the Hudson and the Amazon, are all within 2000 miles, ten days' sail, of Darien. It is a barrier that separates us from the markets of 600,000,000 people—three-fourths of the population of the earth. Break it down, therefore, and this country is placed midway between Europe and Asia; this sea becomes the center of the world and the focus of the world's commerce. This is a highway that will give vent to commerce, scope to energy and range to enterprise, which in a few years hence will make gay with steam and canvas parts of the ocean that are now unfrequented and almost unknown. Old channels of trade will be broken up and new ones opened."

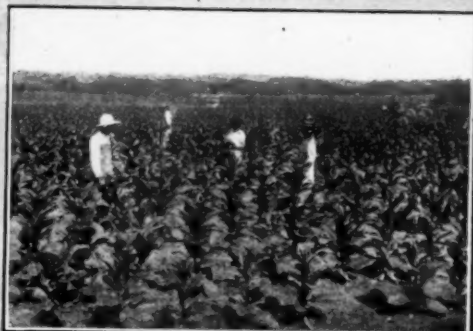
The realization of Maury's prediction made more than half a century ago is now nearing fulfillment. Steam has given place to sail; the population of the Orient has increased far beyond the 600,000,000 of his day. The strategic importance of the Gulf of Mexico and its relation to the world's commerce is now to be realized through the breaking down of the barrier which has separated the Atlantic and the Pacific. Here is to be "the center of the world and the focus of the world's commerce."



COTTON FIELD

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# *A Few Distinctive Southern Crops*



TOBACCO



PECANS



PINEAPPLES



ORANGES



YOUNG SUGAR CANE



JAPANESE THRESHING RICE



A PEANUT HARVEST



GROVE OF GRAPE FRUIT



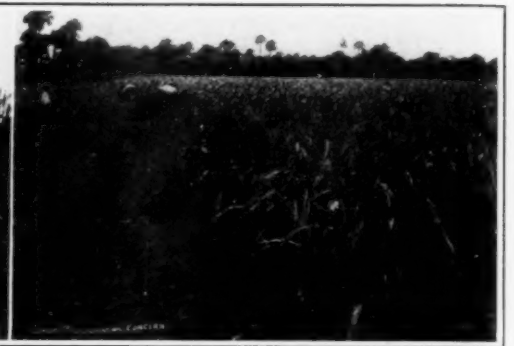
# Grain and Forage Crops



JAPANESE CANE.



SORGHUM.



IN A RICE FIELD.



GETTING IN THE OATS HARVEST.



AMONG THE RANKS OF CORN.



COWPEAS FOLLOWING NAVY BEANS.



MILLET ON SECOND-YEAR SOD.



MILO MAIZE ON DRY FIRST-YEAR SOD.



BROOM STRAW, 2½ TONS PER ACRE.



A BATTERY OF WHEAT HARVESTERS.



STACKING COWPEA HAY.



AN AUTO AMONG THE WHEAT.



TIMOTHY MEADOW.



SOY BEANS.



AN EXPANSE OF BUCKWHEAT.

# Fruits of Highland and Plain



FOUR HUNDRED ACRES IN SEVEN APPLE ORCHARDS.



TANGERINES.



PICKING GRAPEFRUIT.



SEVENTEEN-YEAR-OLD APPLE TREE.



A MOUNTAIN ORCHARD.



APPLE ORCHARD SEVEN YEARS OLD.



TYPICAL HIGHLAND FARM SCENE.



AVACADO PEAR TREE.



PEACH ORCHARD IN CHERT SOIL.



MANGO TREE.



# Specimens of the \$100,000,000 Trucking Industry



CELERY IN PROCESS OF BLEACHING.

YOUNG PEPPER PLANTS.

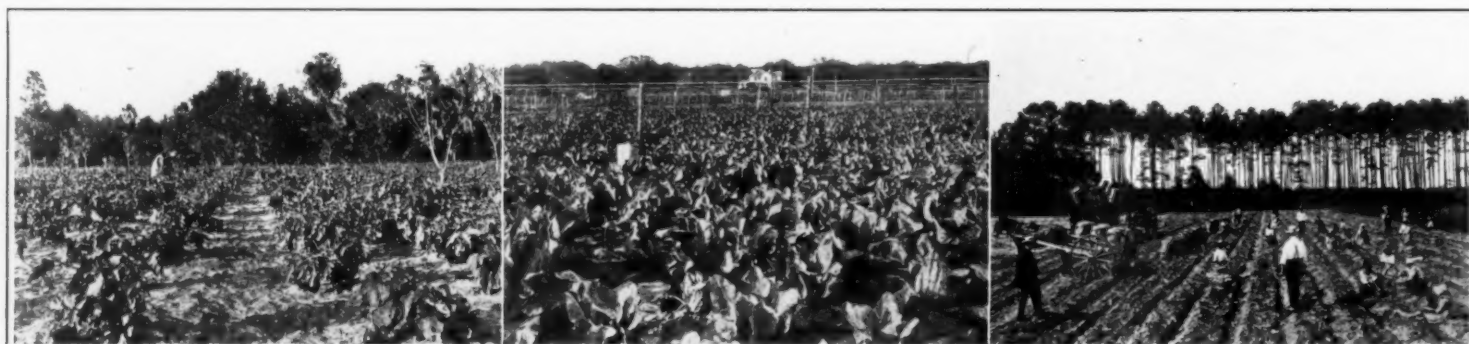
IRRIGATION OF CUCUMBERS.



LETTUCE AND CUCUMBERS.

AN ONION PATCH.

EARLY CABBAGES.



EGGPLANTS.

CAULIFLOWER.

DIGGING IRISH POTATOES.



DEWBERRIES.

A TENANT FARM.

TOMATO FARM.



WATERMELONS.

HAULING A CROP TO THE RAILROAD.

SWEET POTATOES.

# Portland Cement Resources and Industry in the Southern States\*

By ERNEST F. BURCHARD of the United States Geological Survey, Washington.

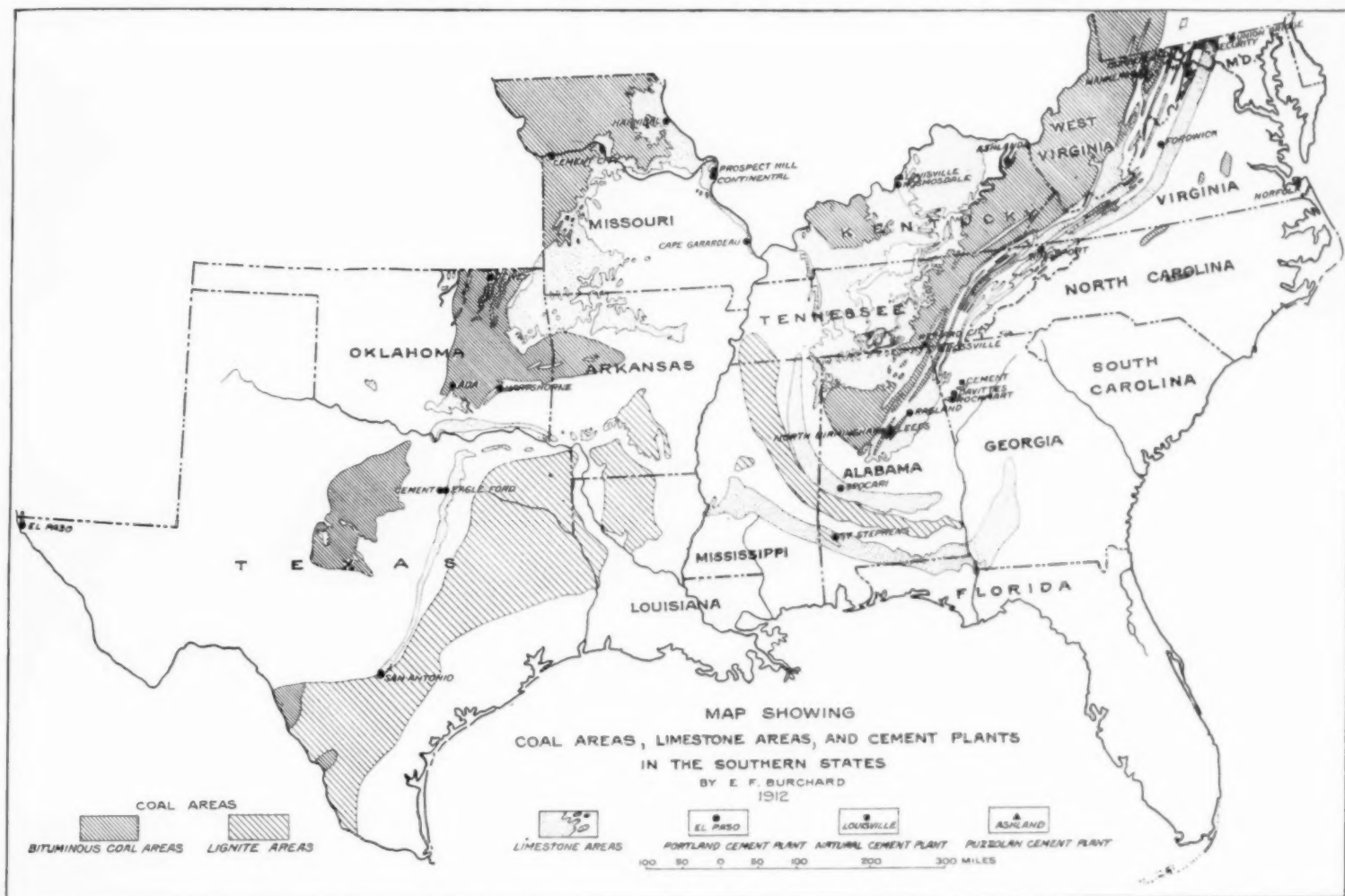


In this article the term "cement" will be restricted to Portland cement, which is by far the most important hydraulic cement. A small quantity of natural cement is still manufactured, after the fashion of burning lime, and a little puzzolan cement is made by mixing pulverized slag and slaked lime, but the combined output of these cements amounts to only a little more than one per cent. of that of Portland cement today.

Portland cement is the product obtained by calcining to a clinker a finely ground artificial mixture of properly proportioned calcareous and argillaceous substances, and finely grinding the resulting clinker.

The raw materials consist essentially of lime, silica, alumina and iron oxide in certain definite proportions, obtained by mixing limestone or marl with clay or shale, or by substituting low-magnesia, blast-furnace slag for

supply the kilns. The modern kiln is of the rotary cylinder type. It consists of a cylindrical steel shell lined with highly refractory material. Recently built kilns range from 110 to 240 feet in length and from 7 to 12 feet in diameter. The axis of the kiln is slightly inclined from the horizontal; the upper end enters into the chimney hood and the lower end receives the fuel nozzles. The fine raw mixture is fed mechanically into the upper end of the rotary kiln, where it travels slowly through the kiln and is acted upon by the incandescent gases which are forced in the opposite direction. Pulverized coal in an air blast is the fuel most widely used for burning cement, but crude oil and natural gas are also used in localities where they are plentiful, and producer gas has been used in a small way. Under the influence of heat, the ingredients in the fine particles are fused together into small, hard lumps called "clinker." The hot clinker falls in a stream from the lower end of the kiln into a steel



clay or shale. The clay, shale, or slag furnish silica, alumina and iron oxide. Impure limestone, called "cement rock," in which all the ingredients are present in nearly the proper proportions, is also used alone or is corrected by the addition of purer limestone. The mixture of raw materials should contain about three parts of lime carbonate to one part of the clayey materials. The burning takes place at a high temperature, approaching 3000° Fahr., and must therefore be carried on in kilns of special design and lining. During the burning chemical combination of the lime, silica, alumina and iron oxide takes place. The product of the burning is a semi-fused mass called "clinker," which consists of silicates, aluminates and ferrites of lime in certain fairly definite proportions. This clinker must be finely ground. A small and limited percentage of gypsum is ground with the clinker. After such grinding, the powder (Portland cement) will set, or harden, under water. This property is due to the compounds of lime with silica, alumina and iron oxide which are contained in the cement.

There are two methods of manufacture, the dry and the wet process, differing from each other in the manner of mixing. In a modern plant using the dry process, the limestone and the clay or shale are brought to the mill in tram cars, are coarsely crushed, dried, if necessary, in rotary cylindrical driers, and are stored in silos. The raw materials are next charged in certain definite proportions by weight, as indicated by their chemical composition, into fine grinding mills which intimately mix the materials during grinding. This fine grinding is performed in various types of mills, such as steel ball, silica pebble tube mills and mechanical mills. The product leaves these mills so finely ground that more than half of it will usually pass a screen having 200 meshes to the linear inch. The fine mixtures are then stored to

bucket conveyor and is carried into the air and cooled, then dumped into heaps and allowed to age or become "seasoned." To this clinker after seasoning is added a small percentage of gypsum, after which the whole mass is crushed and ground to such fineness that 92 to 95 per cent. shall pass a sieve having 100 meshes to the linear inch and 75 to 80 per cent. a sieve having 200 meshes to the linear inch. The fine grinding is performed by mills similar to those used for grinding finely the raw materials. It is then conveyed mechanically to the stockhouse for storage prior to shipment. Most cement is sold in bags weighing 95 pounds each (four sacks of 380 pounds of cement constituting a barrel). There are devices for automatically filling and weighing sacks so that a large output can be rapidly handled. If blast furnace slag is used instead of clay or shale, the process is essentially the same as that already outlined. Instead of deriving the slag from quarries in solid slag heaps, fresh molten slag direct from the blast furnace is granulated by suddenly cooling it with a stream of water, and the granulated slag is then dried and subjected to a preliminary grinding, after which it is mixed in automatic weighing machines with the proper proportion of high-calcium limestones.

The wet or slurry process is employed where wet marl is dredged from the bottoms of lakes, and it is also employed by many plants using hard limestone and clay or shale. In this process, the materials are ground in water and are pumped through pipes to slurry tanks, where they are thoroughly stirred. From 32 to 40 per cent. of water is carried by the slurry, which is next pumped to the kilns. The drying is accomplished in the upper part of the kiln, and the clinkering and finishing of the cement proceeds as in the dry process.

In structural work, cement is seldom used alone, or in the neat form, but as a constituent of concrete. Portland cement constitutes generally from one-

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ninth to one-third part by volume of concrete, the other ingredients of which are sand and either gravel, crushed stone, broken slag or cinders.

#### Growth of the Portland Cement Industry.

The growth of the Portland cement industry in the United States since 1890 has been one of the wonders of the industrial world. In 1890 there were produced 335,500 barrels, a quantity that is now regarded as only the normal production of a small mill having a capacity of about 1000 barrels per day. In the year, 1911, the United States produced 78,528,637 barrels of Portland cement, or about 235 times as much as was produced in the same length of time 22 years ago. In the South the rate of growth has been relatively more rapid, as is indicated below, and in the diagram on the next page. The two main reasons for the remarkable increase in output of Portland cement are, first, its great adaptability to an almost endless variety of uses, and second, the great reductions in cost and selling price that have been brought about through improved machinery, larger manufacturing units, and competition. Prices reached rock bottom in 1909; since then there have been fluctuations, with a tendency to go higher during 1912. In the Southern States west of the Mississippi River, cement has always commanded a price at the mill considerably in excess of the average for the United States.

The table on the next page gives in detail the production of Portland cement by States where possible, for the Southern and all other States in 1910 and 1911.

#### Conditions in the South Favor Cement Manufacture.

To be operated successfully a Portland cement plant must be so located that the following conditions are fulfilled:

1. **Raw Materials.** There should be a supply of limestone and clay or shale sufficient to last 20 or more years at the maximum rate of output for the plant. These raw materials should be as close to the plant as possible, so that costs for handling and transporting may be low.
2. **Fuels.** A supply of good coal should be near at hand, even though natural gas and oil are adjacent and cheap. Natural gas and oil are excellent fuels, but they cannot be depended upon to last long, as has been recently demonstrated in certain States of the Middle West, where plants first changed from gas to crude oil when the gas waned, and then from oil to coal when the oil producers decided to sell no more fuel oil.
3. **Shipping Facilities.** A cement plant must be on transportation routes which reach important markets; sufficient cars must be available at all seasons, and freight rates must be reasonable. There are many advantages in locating the plant where it can ship over two or more railroads, and in addition, over a canal, river, or other body of water if possible.
4. **Markets and Competition.** Good local markets must be assured, free from competition.

As will be shown in the following discussion, the South possesses the potential resources for a greatly enlarged cement industry. The supplies of raw materials are inexhaustible and most advantageously located. The fuel supplies are close at hand, of high grade and widely distributed. Splendid manufacturing sites are abundant along the railways of the South, especially in the limestone valleys, as will be readily realized by anyone who has traveled in that region to any extent. Quarries can in many places be opened on the hillsides and the rock trammed by gravity to the mill. Water supplies are abundant in the region of copious rainfall, and cheap electric power for operating crushing, grinding and conveying machinery is being developed throughout the Southern Appalachians. Railway building is rapidly increasing; river navigation is being improved and ocean and gulf transportation facilities are available at many ports. As for markets, the statistics show that the South is consuming much more cement than is manufactured within her borders. With the opening of the Panama Canal an export market for cement will arise. There would thus seem to be little doubt that properly located and well-equipped Southern mills should be in a position to practically control the local cement trade, to ship considerable into bordering States and to exert a commanding influence on the export trade to the southward.

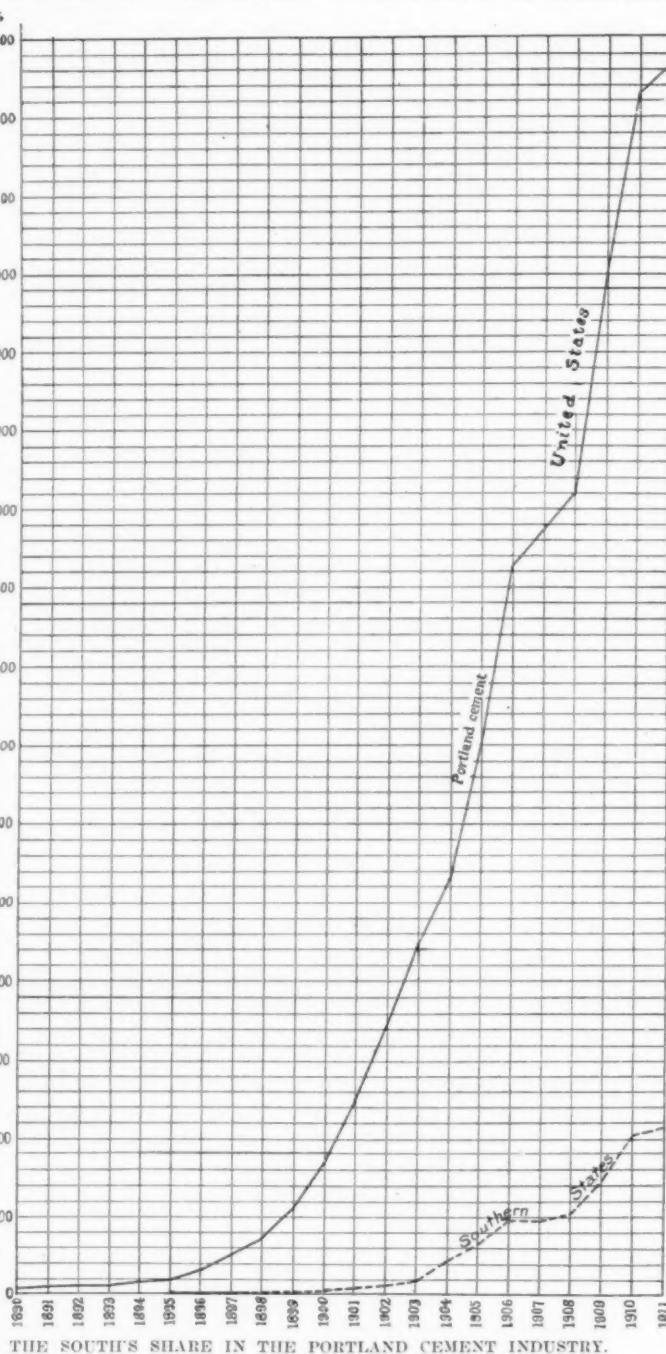
The by-products of cement manufacture, or rather incidental products,

often prove a source of profit. Waste rock that may contain impurities, such as chert, magnesia, etc., can be crushed at a cement plant and sold for railroad ballast, concrete and road metal. There is a great demand for these products in the South today. High-grade limestone, such as is used in cement manufacture, is also suitable for the manufacture of lime, for fluxing iron ore, in the manufacture of steel, chemical salts, glass, paper and numerous other products. Lime and limestone to meet these demands can be marketed by cement manufacturing companies at good profits.

#### Distribution of Limestone and Fuels in the Southern States\*.

It is proposed to summarize here the most important limestone and shale formations that have been found to be suitable for the manufacture of Portland cement in the Southern States, and to indicate their geographic relations to the coal fields. The distribution of the largest areas of limestone and coal, as well as that of the Portland, natural and puzzolan cement plants, is shown on the map on the preceding page.

Of prime importance are the "valley limestones" that extend in several parallel, nearly unbroken, chains southward throughout the Appalachian valleys from Western Maryland to North Central Alabama, passing through Western Virginia and Eastern West Virginia, East Tennessee and Northwest Georgia. These rocks are all very old, having been formed mainly in Cambrian, Ordovician and Silurian times. In places, beds of magnesia limestone and dolomite alternate with high calcium limestone, but the two varieties can be easily distinguished by an experienced investigator, and the individual beds can be traced without difficulty. Shale and clay necessary to mix with limestone are found generally in close association, the clay often occurring as residual from the limestone. The Southern Appalachian coal fields, comprising 42,000 square miles of bituminous coal-bearing rocks, border these limestone valleys on the northwest, and there are also great areas in West Virginia containing natural gas and oil, and promising ones in Tennessee, Kentucky and Alabama in which these latter fuels are being sought. In Western Kentucky there is an area of 6400 square miles of coal measures, almost surrounded by limestone. Another large limestone area crosses Central Kentucky and Tennessee and Northern Alabama, and affords large supplies of limestone near the coal fields of these States. Two important areas of limestone of later age lie between the areas just described and the Gulf Coast. The inner area, of Cretaceous age, outcrops in a crescentic belt 15 to 25 miles wide, from Southeastern Alabama to Southwestern Tennessee, crossing Northeastern Mississippi. The outer belt, of Tertiary age, is of about the same width. It crosses Mississippi from Vicksburg in a southeasterly direction, passing across Southwestern Alabama into Northern Florida, then curves northeastward nearly to the middle of Georgia. The Cretaceous and Tertiary limestones are much softer than the older rocks. Residual and interstrat-



ified clays, as well as alluvial clays that lie in river and creek bottoms, are available.

A broad crescentic area of lignite-bearing rocks lies between the areas of Cretaceous and Tertiary limestone in the lower lands of Tennessee, Mississippi and Alabama, and eventually may afford, under improved methods of utilization, convenient supplies of fuel for power purposes, though it may not possess sufficient calorific power to be used as a kiln fuel.

In Missouri and Arkansas, limestones ranging in age from Ordovician to Carboniferous occupy extensive areas along Mississippi, Missouri and White River Valleys; also a large part of the Ozark uplift. Missouri contains an area of 23,000 square miles of bituminous coal-bearing rocks. The Ozark limestone area also extends into Northeast Oklahoma. In Northern Oklahoma are several thin belts of Carboniferous limestone, continuations of important cement-making limestones of Kansas. In Southern and Southwestern Oklahoma, in the Arbuckle and Wichita Mountains, respectively, a great thickness, probably nearly 8000 feet of paleozoic limestones occur, and in Southeast Oklahoma along the southern edge of the coal field a long narrow belt of

\*More detailed descriptions will be found in Advance Chapters from Mineral Resources, 1910 and 1911, on the Cement Industry, and in Bulletin 522, all of which are distributed free of charge by the U. S. Geological Survey, Washington, D. C.

carboniferous limestone outcrops, which attains a thickness of nearly 300 feet in places. The eastern end of this belt extends nearly to the Arkansas line on the north flank of the Ouachita Mountains and the western end reaches the Arbuckle Mountains. A long belt of Cretaceous limestone lies along Red River and extends into Southwest Arkansas. Oklahoma and Arkansas together contain an area of 11,584 square miles of bituminous coal-bearing rocks, and Arkansas contains in addition about 6000 square miles of lignite areas. In Texas there are a number of limestone formations which yield material suitable for making Portland cement. Carboniferous rocks are reported to occur in North-central Texas and in the trans-pecos region of Western Texas, but the limestones of Cretaceous age in central, northern and extreme western Texas are probably the best adapted for making Portland cement. The principal area of Cretaceous rocks in Texas is a belt extending southward across the central part of the State from Red River to the Rio Grande. The cities of Sherman, Dallas, Fort Worth, Waco, Austin and San Antonio are located on this belt. A railroad either follows or parallels this belt, and many railroads cross it. Two divisions of the Cretaceous along this belt

for cement manufacture fall into two classes, distinct geographically as well as geologically. They are (1) the crystalline limestones of Western North Carolina, and (2) the soft limestones of Eastern North Carolina. In the extensive area of metamorphic and igneous rocks that covers the western half of North Carolina, outcrops of crystalline limestones or marbles are common. Many of these marbles are highly magnesian, but certain of them are low in magnesia. In Eastern North Carolina, heavy beds of soft limestone or "shell beds" occur in the Tertiary rocks of the Coastal Plain. These beds are usually low in magnesia, but in places contain considerable percentages of clayey matter or of sand. They occur as thin, but fairly continuous beds, made up of shells or fragmental material, and extend along the entire coast of North Carolina, being most exposed along the larger streams. In South Carolina, as in North Carolina, the limestones possibly available for Portland cement making may be divided into two divisions, geologically and geographically. The western portion of the State contains a number of beds of metamorphosed limestone or marble that may be satisfactory in composition for Portland cement. At Gaffney limestone is burned to lime. In the Coastal Plain, soft limestone or shell beds of Tertiary age, the so-called "marls," outcrop at many points.

#### Portland Cement Industry in the Southern States.

Portland cement is manufactured by 22 plants situated in 10 out of the 16 Southern States. Probably the first Portland cement mill established in the South was at Austin, Tex., about 1895, and there was a small mill at White Cliffs, Ark., in operation in 1897. A mill was established at Fordwick, Va., in 1900 and plants in Alabama, West Virginia, Georgia, Missouri, Kentucky, Oklahoma, Tennessee and Maryland followed, but only a relatively small quantity of cement was produced prior to 1903. In 1911 the number of plants had increased to 22 and the production was 10,881,415 barrels, or nearly 14 per cent. of the total output of the United States. Large though this output may appear, the population of the 16 Southern States was in 1910, 35.3 per cent. of that of the United States, which is evidence in itself that the consuming power of the South, if on a par with that of the rest of the country, is considerably in excess of the production of cement in this section. Viewed in another light, the annual production of cement per capita in the United States, using the census and survey figures for 1910, is about 316 pounds. In all the Southern States the annual production of cement per capita is about 119 pounds, while in the Southeastern States it is only about 64 pounds per capita. There is apparently a large excess production in the East, which indicates a movement of cement from that section to the South. There is thus not only an apparent shortage of output of cement in the South, but there is no other section of the United States in which cement is going to play such an important part in future developments. Cement-concrete is now indispensable to practically every phase of industrial, civic and rural life. Reinforced concrete buildings, warehouses, factories, chimneys, railways, mines, canals, docks and piers, bridges, tunnels, water reservoirs, dams, sewer systems, pavements, lamp posts, sidewalks, curb and gutters, fountains, water troughs, silos, farm buildings and an endless variety of other uses for this material might be mentioned, and the demand, especially in the South, is only just beginning. In addition to the local demand, it appears that there should soon be a better opportunity for an export trade than in any other part of the United States. The exports of cement from the whole United States are as yet less than half the production of the Southern States.

Considering, then, that the South has vast areas of closely associated cement materials and fuels, advantageously situated with respect to transportation routes; abundant and cheap power, a rapidly increasing local market which an already thriving industry is unable fully to supply, besides the prospect of a large export trade, the cement manufacturing industry can safely be regarded as one of the great assets of the South in the coming years.

1910. Southern States.			1911. Southern States.		
State.	Quantity (barrels).	Value.	State.	Quantity (barrels).	Value.
Texas .....	4		Mo. ....	4	
Okla. ....	2	2,287,445	Texas ....	4	4,114,859
Mo. ....	4		Okla. ....	2	2,438,493
Ala. ....	2		Tenn. ....	2	
Ky. ....	1	5,198,586	W. Va. ....	1	1,981,341
W. Va. ....	1	4,458,274	Ky. ....	1	1,590,438
Ga. ....	1	1,481,359	Va. ....	2	1,487,753
Tenn. ....	1	1,323,495	Md. ....	2	1,084,315
Md. ....	1	1,206,158	Ala. ....	2	
Va. ....	2	830,218	Ga. ....	2	858,969
Total ....	19	10,173,548	Total ....	22	10,881,415
		\$9,276,833			\$9,347,786
Northern and Western States.			Northern and Western States.		
Pa. ....	25	26,675,978	Pa. ....	25	26,864,679
Ind. ....	5	7,219,199	Ind. ....	5	7,407,830
Kan. ....	11	5,655,808	Cal. ....	8	6,317,701
Cal. ....	7	6,385,588	Kan. ....	12	4,871,903
Wash. ....	2	5,726,832	Ill. ....	5	4,582,341
Ill. ....	5	5,505,520	N. J. ....	3	4,411,890
Iowa ....	2	4,184,698	Mich. ....	11	3,686,716
N. J. ....	3	3,687,719	N. Y. ....	7	3,314,217
Mich. ....	12	3,378,940	Iowa ....	3	1,952,590
N. Y. ....	8	3,296,350	Ohio ....	5	1,451,852
Ohio ....	5	1,527,670	Wash. ....	3	960,573
Ariz. ....	1	1,204,761	Utah ....	3	662,849
Colo. ....	2	811,800	Colo. ....	2	1,162,081
Mont. ....	1		Mont. ....	1	
Utah ....	3				
Total ....	92	66,376,403	Total ....	93	67,647,222
Grand total. 111		\$58,928,967	Grand total. 115		\$78,528,637
		\$68,205,800			\$66,248,817

contain limestone deposits of remarkable purity and thickness. Texas has 13,500 square miles underlain by bituminous coal-bearing formations and an area of 53,000 square miles underlain by lignite-bearing rocks. Lignite is used in certain Texas plants to make producer gas, which, burned in gas engines, furnishes power for crushing and grinding cement materials.

In certain of the Southern States, such as Louisiana and the Carolinas, the limestone deposits are less extensive, but, nevertheless, are of interest and of possible value in places. In Louisiana, for instance, a crystalline limestone of a high degree of purity has been reported from Winnfield as having been utilized for making lime. In North Carolina the limestones possibly suitable

## Undeveloped Wealth in the Building Stones of the South

By A. T. COONS of the United States Geological Survey.



WHILE the stone industry of the Southern States is perhaps not so well known as some of the other natural resources, it is, nevertheless, one of importance and is constantly increasing in value of output and also in the diversity of uses which are being found for the different stone products. The first uses of stone in this country are recorded in the various picturesque stone houses and barns built of stones of no particular shape and plastered together into a very effective whole which are found scattered along the old country roads and turnpikes, moss covered and stable as when first built, plain markers of the growth and expansion of the country for all generations. Then, too, the old chimneys and stone ovens, the tumbled-down limekilns, the rough stone fences, the old millstones, and the rude grave markers, with their quaint legends, all show the first use of stone to the settlers. Most of the stone was taken from the top of the ground with but little labor and expense for these comforts and conveniences. After these rude efforts came the use of quarried stone, cut into regular slabs for foundations of all classes of buildings and for the buildings themselves. As the country developed the stone was used for pretentious bridges, monuments, mausoleums—beautifully carved and decorated—stone floors, handsomely polished and carved work for entrances, lobbies and halls of buildings, tiles, slabs, mosaics, aqueducts, piers, fences, walls for protection against the encroachment of the sea, rough stone thrown into dangerous eddies

in the mouths of rivers and along the seacoast for quiet harbors for ships. With the necessity for transportation came the use of crushed stone for the ballasting of railroad tracks, which required a smooth and unyielding roadbed for the rapid passage of the heavy trains that made possible the extensive travel and rapid exchange of the interstate commerce which has tended to develop the country. Then, too, the opening up of the country by means of roads for wagon and automobile traffic has caused a large use and consequently a large demand for crushed stone for road foundations, and the use of cement has also created an unprecedented demand for crushed stone used for buildings, pavements, bridges, roads, etc. Also the use of stone, especially limestone, where the chemical composition of the stone adds to its value, is found in the enormous quantities of stone that supply the iron furnaces with food for the smelting of their ores, fluxing the various ores and rendering them suitable for market. Limestone is also used in large quantities in the manufacture of lime and cement, and finds minor uses in the manufacture of carbonic-acid gas, glass, paint, alkalies, sugar refining, fertilizers, mineral wool, whitening, etc.

Sandstone of the proper quality finds a ready sale when ground into sand for the making of glass, and as crushed stone, called Ganister, in the making of fire-resisting brick used for lining furnaces and converters. Large quantities



of sandstone also go into the manufacture of abrasives, such as oilstones, whetstones, grindstones, pulpstones and scythestones.

The granites and marbles find their principal use in building and monumental stone, and while experiments have been tried to use the highly feldspathic granites as a source of potash, they have not been entirely successful as yet.

Slate and its uses for roofing material and for milling into a large variety of articles of use for general utility purposes must not be omitted from the natural stone resources of the country, as this variety of stone as found in the United States forms a valuable asset and ranks with the best slates of the world.

The value which the stone output of the entire United States has reached was, in 1911—the latest year for which statistics are now available—\$77,108,567, according to the United States Geological Survey. This value, compared with that for 1906, of \$66,378,794, and for 1901, of \$47,284,183, represents an increase of \$10,729,773, or about 16 per cent., during the past five years, and of \$29,824,384, or about 63 per cent., in 10 years. These figures do not include the value of the lime nor of the cement manufacture from limestone, nor of the abrasives or the glass sand made from sandstone, as the values of these products is included under the respective subjects in order to prevent any duplication of values. Slate also does not enter into the above figures, being treated as a separate subject. Fifty States and Territories contributed to the total stone output of the United States in 1911, and of the Southern States 15—Missouri, Georgia, Tennessee, Kentucky, Maryland, West Virginia, Alabama, North Carolina, Virginia, Oklahoma, Texas, Arkansas, South Carolina, Florida and Louisiana—ranked according to value of output, report a production of stone. This represents 30 per cent. of the States, and the value of their stone output in 1911 was \$14,276,164, or a little more than 18 per cent. of the total output. The year 1911, however, showed an increase of \$3,035,705, or 27 per cent., over the output for 1906, which was \$11,240,459, and an increase of \$6,658,164, or 87 per cent., over 1901, when the value recorded for the stone output was \$7,618,000. This shows, therefore, 11 per cent. more increase in the stone output of the Southern States than for the total United States for the past five years and 23 per cent. for the past ten years.

Notwithstanding the comparatively small percentage of total stone output represented by the Southern States, this increased percentage gain over the entire country for the past five and ten years is very encouraging and shows the activity of development in the Southern States, and an even more rapid increase is indicated for the next five and ten years. For the Southern States have within their borders some of the most prominent quarry districts in the United States, from which stone has been shipped to many of the Northern, Central and Western States, entering the markets in other stone districts and finding decided favor. The South has all the varieties of stone which enter into commercial markets, these stones being generally classed as the limestones, including both the calcium and dolomitic stones; the granites, including gneiss, a small quantity of traprock and other rocks of igneous origin; the marbles, the sandstones and the slates.

A brief discussion of the kinds and importance of the stones produced in the Southern States is given below by States, according to the rank of the State in value of output. All of the Southern States except Mississippi have mineral wealth in shape of valuable stone deposits, and even Mississippi has deposits of stone which may some day be developed to commercial importance.

#### MISSOURI.

Missouri, with a stone production of \$2,338,585 in 1911, easily ranks all of the other Southern States with 16 per cent. of their production, and stands tenth in rank with 3 per cent. of the production for the entire United States. Of the output of this State \$2,179,767, or over 90 per cent., is represented by limestone, which is quarried in from 42 to 50 of the 114 counties of the State. With the exception of an entirely separate area in the southwestern part of the State, the limestone quarries extend all along the Mississippi River boundary of the State, but near St. Louis the quarry region begins to spread across the State in a northwesterly direction to the many quarries at Kansas City and then to the extreme northwestern portion of the State. The greater number and most productive quarries in this area are the quarries on the river bluffs in St. Louis county, in St. Louis city, and in Jackson county near Kansas City. The stone in St. Louis city and St. Louis county is from bluff quarries along the river and in what are known as "sunken" quarries in the interior. The bluff quarries require very little machinery, the stone is easily quarried and loaded on boats for shipment, while the other quarries necessitate the cutting out of the stone and raising it to the surface of the street before loading for delivery. All of this stone is used for foundation and rubble stone, with large quantities of crushed stone for road building and concrete, St. Louis city using nearly all of the available material for road construction. There are in the neighborhood of 35 quarries in operation in St. Louis city and St. Louis county, with an average yearly output of \$20,000 worth of stone per quarry. In point of value of output the Kansas City, Jackson county, quarries rank next. In the hills surrounding this city there are about the same number of quarries as operated in the St. Louis district, but the average yearly output is about \$14,000 for each quarry. This stone is sold for rough building stone, for rubble and crushed stone. But the most interesting and perhaps most valuable, although much more recently, developed quarry region in Missouri is the limestone at Carthage, Jasper county. Although this stone has been used for a long time locally for foundations, bridges and general building purposes, the first quarry machinery was not installed until 1885. Since that time, however, this region has become one of the most complete quarry centers in the State. The Carthage stone is, in the rough, a medium fine-grained, light bluish-gray stone, but when cut and dressed it is very white and of uniform color through-

out the quarries. It is more difficult to dress than the well-known Bedford (Indiana) stone, but the great uniformity of color makes up for this disadvantage. It is almost entirely used as a building stone, and in 1911 there was produced by the nine quarries operating 427,974 cubic feet of building stone, rough and dressed, with a value of \$293,470 at the quarries, besides stone for other uses sufficient to bring the total value to \$324,789. In this Southwestern limestone district Greene county, at Springfield, also furnishes a large quantity of good building stone. Other regions furnishing large quantities of limestone, mostly for rubble and crushed stone, are Andrew, Cape Girardeau, Lincoln, Marion, Perry, Pike, St. Charles and Ste. Genevieve counties. Lime is also manufactured in this State, Missouri ranking fifth among the lime-manufacturing States of the United States, with a production of 158,368 short tons, valued at \$722,563 in 1911. This lime was burned chiefly in Greene, Jefferson, Lawrence, Marion, Miller, Ste. Genevieve and St. Louis counties, although nine other counties contributed small quantities. The granite for which Missouri is famous, although there has not developed so large an industry as in some of the other States, is quarried principally in St. Francois and Iron counties, although deposits occur in other places in this same southwestern section of the State. This granite is in general an even-grained, medium fine stone, in color varying from gray to deep red, the red predominating. It is used mostly for building, but also finds a sale for paving blocks, crushed stone, curbing and flagging. It has been shipped largely throughout the United States, and even entered the New England States in favorable competition with the famous Barre, Concord, Westerly, Milford and Quincy granites.

The sandstone, used entirely for building purposes, comes nearly all from Johnson and Howard counties, and while these localities contain much good material which has been widely used throughout Missouri, it has not found as large a commercial market as the limestones and the granites. While marble and the onyx marbles are found in Missouri, there has not been sufficient development to supply even the local markets.

#### GEORGIA.

Georgia, with its celebrated marble and granite deposits, ranks second among the Southern States with a value of stone production amounting to \$1,967,077, or about 14 per cent. of the value of these States. Georgia ranks twelfth among the stone-producing States of the United States.

It is in marble that Georgia excels in stone production, and in this ranks first among the Southern States, producing more than 950,000 cubic feet, valued at \$1,088,422, or 50 per cent. of the marble output. Georgia ranks next to Vermont in the total marble production of the United States, and produced 13 per cent., while Vermont's output in 1911 of over 1,190,000 cubic feet, valued at \$3,394,930, was about 45 per cent. of the production of the entire United States. The obviously larger value per cubic foot is not due to any decided superiority of Vermont marbles, but to the fact that most of the Vermont stone is sold by the quarrymen as dressed or milled stone, and so reported, while that of Georgia is sold in the rough at the quarry to the mills, and therefore reported in this manner. The marble deposits of Georgia are in Northwestern Georgia in the Piedmont Plateau, which contains so much of the mineral wealth of the Southeastern Atlantic States, but it is in but one county and from but four or five operators that most of the material is obtained. This county is Pickens, and the industry is said to have begun in 1840 in the vicinity of Tate. The stone is a true marble of a beautiful white-grained or white delicately-veined stone. Most of it is used for building purposes and has found a market in nearly all parts of the United States, going North to meet the Vermont marbles, and even penetrating into the hearts of the different granite regions. At Hot Springs, in Cherokee county, is found a dark-green stone called Verde Antique marble, which is not a marble, but a serpentine. Although generally classed with the marbles, this dark-green stone is beautifully veined and has been much in use as an interior decoration in halls, vestibules, lobbies, etc.

Other marble deposits are in Cobb, Floyd and Gilmer counties, but they have not as yet been thoroughly developed, and when quarried the stone has not had much more than a local market.

Georgia also produces more granite and gneiss than any other Southern State, the value being \$847,023 in 1911, although closely pushed by Maryland, with an output of \$845,936. The granite extends across the north-central part of the State, and while granite is obtained in a large number of counties, the regions best known other than locally are in De Kalb, Gwinnett, Rockdale, Elbert, Thorpe and Hancock counties. The deposits at Lithonia and Stone Mountain in De Kalb and Rockdale counties, in the north-central part of the State, have furnished the largest amount of the granite quarried, and have been used principally for building, rubble, paving blocks and crushed stone, while monumental stock is mostly obtained from Elbert county. The Georgia stone varies in color from a light gray to a dark gray and from medium to fine grain in texture. Much interest attaches to the granite and gneiss deposits of Georgia, owing to the nature of their formation, where most of the stone is either exposed at the surface or the bare rock rises in dome-like masses to heights of 75 to 200 feet, and at Stone Mountain to nearly 700 feet above the surrounding plain. Stone Mountain has a circumference of about seven miles and has furnished large quantities of good granite for over 50 years, and still contains a seemingly inexhaustible supply. Georgia also yields limestone for flux, cement, foundation work and crushed stone from Dade, Gilmer, Polk and Walker counties, and lime is burned in Bartow, Catoosa, Dade, Hall, Polk and Wagner counties. In addition, Georgia has a well-defined slate area in the northwestern part of the State near Rockmart, Polk county, from which black slate of exceptionally good quality may be obtained, and also quite recently a deposit of green slate near Bolivar, Bartow county has been opened. Although considerable development work has been done on these deposits, they have never had other than local market, yet the quality of the slate and the demand

for slate as the most satisfactory of roofing materials would seem to warrant further operations.

#### TENNESSEE.

Following Georgia comes Tennessee, with a stone output valued at \$1,499,648 in 1911, just a little over 10 per cent. of the stone output of the Southern States. This production is divided quite equally between marble (valued at \$700,229) and limestone (valued at \$798,369), but while limestone shows the higher values, the marble is better known; in fact, this Tennessee marble is known to marble dealers and quarrymen all over the United States and in foreign markets as well. While geologists do not call this stone marble, but a very fine, highly crystalline limestone, it is known as marble throughout the stone trade and answers to the same uses as the true marbles. This stone ranges in color from beautifully-veined light pink and gray to a very dark, rich chocolate color. This latter color is nowhere seen to greater advantage than in the large blocks which form the base of the massive columns in the rotunda of the Congressional Library at Washington, D. C. Most of this marble is quarried in the eastern part of the State. Knox and Blount counties, in the neighborhood of Knoxville, produce the most, but deposits are also worked in Anderson, Campbell, Coffee, Cumberland, Franklin, Hawkins and Union counties. New quarries are being developed and opened all the time and the industry seems to be in a very flourishing condition. There was 414,128 cubic feet of marble sold by the quarrymen in 1911. Most of the Tennessee marble is sold in large blocks or slabs to the mills to be worked up into the finished product, but a few of the quarries have their own mills. Some of the waste stone of the quarries is utilized for the manufacture of lime.

Most of the limestone with which this State seems to be plentifully supplied is used for furnace flux, crushed stone for road making, railroad ballast and concrete, while only a small quantity is used for rough building stone and rubble. Over 32 counties furnished a commercial output in 1911, Davidson, Hamilton and Knox counties being the largest producers. Nearly all of this limestone is suitable for lime burning, but the number of lime manufacturers is comparatively small, varying from 14 to 20, with a yearly output of about 50,000 tons and an average value at the plant of about \$3 per ton.

Small quantities of sandstone are quarried for local use, and slate deposits in Blount, Monroe, Sullivan and Washington counties have been somewhat developed, but very little slate has been marketed.

#### KENTUCKY.

Kentucky follows Tennessee with a stone output valued at \$1,221,609, or nearly 19 per cent. of the output of the Southern States. Of this over 90 per cent. represents the products of limestone quarries in 35 or 40 counties scattered over the entire State, but the principal quarries are, with one exception, somewhat massed in the north-central and east-central part of the State, especially in Jefferson, Jessamine and Rockcastle counties, where large quantities of stone are quarried for crushing purposes, with smaller quantities for building, flux and curbstone. The other locality where limestone is quarried in considerable quantities and which represents a higher grade of the stone industry is in Warren county in the vicinity of Bowling Green. Here is found an oolitic limestone very light in color and similar to the well-known "Bedford" stone of Indiana. This stone is worked and dressed for building stone as well as minor uses for curbing, flagging, flux and crushed stone. It has found a considerable market outside of the State, and is used also in the manufacture of lime.

Lime is also burned in Breckenridge, Carter, Christian, Lyon, Meade, Rockcastle and Scott counties, but the industry only amounts to from 4000 to 5000 tons per year.

Sandstone is quarried to considerable extent in Rowan, Rockcastle and Muhlenburg counties, with small quarries in Bell and Knox counties. All of this is used as a building stone. The Rowan county material is a fine-grained, light-gray stone and produced in larger quantities than at the other deposits.

There is said to be no true marble found in Kentucky, but the cave deposits of so-called onyx marble in Barren county have been utilized for decorative and ornamental purposes.

#### MARYLAND.

Maryland follows Kentucky with a stone output valued at \$1,152,714 in 1911, but, unlike Kentucky, Maryland has a good supply of all kinds of stone. The granites in this State have the greatest value, nearly 75 per cent. of the whole, and are found in Cecil, Harford, Baltimore, Baltimore city, Howard and Montgomery counties, a belt extending from the northeast corner directly across the State. This granite includes gneiss, gabbro and allied igneous rocks, and Baltimore county and Baltimore city give the largest value of production, the stone being used for building and monumental work, paving blocks and crushed stone. Harford county, near Havre de Grace, furnishes a large quantity of crushed stone, while Cecil county at Frenchtown, Port Deposit and Rising Sun, and Howard county at Ellicott City and Guilford, supply building stone, paving blocks and crushed stone, while the Montgomery county output is again limited to crushed stone. This Maryland granite and gneiss is a fine to medium grained stone, varying in color from light to dark gray. Many of the quarries are on tidewater, which gives an advantage of good shipping facilities. Baltimore city and Washington, D. C., consume a large quantity of the crushed stone in the building and repair of roads.

Limestone comes next to granite in rank of output, and, besides a small quantity produced near Baltimore, the commercial deposits are massed in a belt extending across the west-central portion of the State from northeast to southwest, the chief producing counties being, in order of importance, Washington, Frederick, Allegany and Carroll, and the stone is nearly all crushed for road-making, railroad ballast and concrete. From 110,000 to 125,000 tons

of lime are burned yearly, mostly in Frederick, Carroll and Washington counties, and the average price at the kilns is a little over \$3 per ton. A considerable quantity of the lime burned in this State is burned in stack kilns by farmers, who spread it on the land for sweetening the soil, and this gives a smaller average price than would otherwise exist. Three of the lime manufacturers have hydrating plants in connection with their kilns, and the lime industry is a flourishing one in this State.

The marble quarrying has been confined for a long time to the operations of one firm near Cockeysville, Baltimore county, with occasional small productions from quarries in Carroll, Harford and Washington counties. The Cockeysville stone is a very white, rather coarsely crystalline stone, while the other quarries report green (serpentine) and other darker marbles.

The sandstone industry is confined to Allegany, Baltimore, Carroll, Garrett and Washington counties, but is of no special importance except for local markets.

Slate is a very old industry in this State, and is quarried in Harford county, near the Pennsylvania State line, at Cardiff, and is part of the famous "Peach-bottom" district. It is a dark, unfading slate, and has always been noted as one of the best in the United States.

#### WEST VIRGINIA.

West Virginia, with a stone production valued at \$1,106,012, is the last of the Southern States to have an output of over \$1,000,000, and nearly 99 per cent. of this is limestone, quarried chiefly in the northern part of the State in Berkeley, Jefferson, Greenbrier and Monongalia counties, and used primarily for furnace flux for the Pennsylvania and West Virginia furnaces and to supply railroad ballast and crushed stone for concrete and road-making. West Virginia supplies in the neighborhood of 1,000,000 tons of stone yearly for furnace flux and over 900,000 tons of crushed stone, mostly railroad ballast. In 1911 nearly 180,000 tons of lime were manufactured in the State, largely from the same northern section. In Preston county, however, a considerable quantity of lime is burned in small stack kilns for use on land, which brings down the value at the kiln to about \$3 per ton. With the exceptions of small operations in Kanawha, Fayette and McDonald counties, sandstone is quarried mostly in the northwestern part of the State, and used for rubble, building, curbing, riprap and crushed stone. Some of the sandstone along the Ohio River in Wood county is used for the manufacture of grindstones, and in Morgan and Preston counties the sandstone is found as large bodies of pure sand, largely utilized for glass making.

But little marble is found in the State, and such slate deposits as have been examined have not been considered to contain material worthy of development.

#### ALABAMA.

While Alabama could not pass the \$1,000,000 mark in value of stone production, it did, nevertheless, with an output of \$923,998, nearly equal it. Nearly 60 per cent. of this total was limestone, quarried chiefly to supply the iron furnaces with material for fluxing their ores. With a few exceptions, the limestone quarries are in the northern and northeastern part of the State, principally in Jefferson, Etowah, Franklin, Blount, Shelby and Tuscaloosa counties. The Stone from Franklin county is an oolitic limestone, very much like the celebrated Bedford (Ind.) stone, and extensive quarries are open for building stone as well as crushed stone and flux. The stone from Shelby county is mostly burned into lime, about 80,000 tons being produced annually in the State.

The stone next in point of value is marble, chiefly from Talladega county, where there are now being worked extensive deposits of fine white, or white marble somewhat veined. This industry is of comparatively recent development. The marble is used for statuary as well as monuments and buildings.

The quarrying of sandstone is not extensive, and is confined to Calhoun, Jefferson, St. Clair and Tuscaloosa counties. It is used locally for building stone, for furnace linings, curbing and flagging.

Granite, although occurring in Alabama, has never been quarried to any extent, but in 1911 some from the bed of the Chattahoochee River was utilized in connection with river improvement work.

#### NORTH CAROLINA.

North Carolina is noted for the variety of mineral products within its borders. Neither is stone limited in variety, although of the output for 1911, valued at \$826,928, nearly 95 per cent. was granite. Surry and Rowan counties furnished by far the greater part, but granites are distributed over much of the total area of the State. The noted Mt. Airy granite in Surry county is a medium-grain, very light-gray granite, and is quarried over a space of 40 acres on a hill of bare rocks, rising about 125 to 130 feet above the surrounding country. This granite is used for building, monumental work, paving blocks, crushed stone and curbing, and has found a considerable market in the Northern and Middle States. The Rowan county granite is near Salisbury at Dunns Mountain, Faith, Granite Quarry, Rockwell and Bear Poplar, and is either a very light gray, nearly white, or a decidedly pink granite. It is used for building, monumental work, curbing, flagging, paving blocks and crushed stone, and has found a market in many of the Northern States. Other localities where considerable granite has been quarried recently are near Asheville, Buncombe county; Wise and Warrenton, Warren county; Charlotte, Mecklenburg county; Graystone, Vance county, and in Gaston, Henderson, Polk and Wilson counties.

Limestone has been quarried in Cherokee, Henderson, Transylvania and Yadkin counties in North Carolina, and some lime has been burned, but not extensively. In Craven and Jones counties the shell marl has been calcined to furnish lime for use as a fertilizer.

The marble deposits in Cherokee and Swain counties have been but little



worked, although quite recently more interest has been taken in the deposits and considerable stone taken out, some of it used for smelter flux.

Sandstone has been quarried in Anson, Lee and Moore counties, but only for local use.

#### VIRGINIA.

Virginia closely follows North Carolina with a stone output valued at \$821,798 in 1911. Virginia's production, however, is divided about equally between granite and limestone, with a small proportion of sandstone. The granites, including gneiss and allied igneous rocks, quarried in this State are confined to a small number of localities, although there are many outcrops of granitic rocks distributed throughout the State. These granites vary in texture from fine to medium coarse, and in color from light gray to dark gray and dark blue-gray. The largest number of quarries and the greatest output comes from the district around Richmond and Petersburg in Henrico, Chesterfield and Dinwiddie counties. This stone is used for building, monumental, paving, curbing and crushed stone. Much granite or gneiss has been quarried in the northern part of the State, along the Potomac River in Loudoun, Alexandria, Fairfax and Prince William counties, for use as building and crushed stone, supplying the city of Washington with road material and also furnishing material for seawalls, for various piers and bridges near the city. This class of stone is also quarried near Fredericksburg in Spotsylvania and Stafford counties; near Lynchburg in Campbell county, and in Nelson, Goochland, Fluvanna, Cornelia, Lunenburg, Greensville, Charlotte and Pittsylvania counties. The granite from the quarries in the area around Petersburg, Richmond and Fredericksburg have an established reputation as a high-class stone, and have been shipped to many of the principal cities of the South and East. The other stones have more or less local use.

The limestone produced in the State is used chiefly for flux, crushed stone for roads and railroad ballast. Giles, Rockbridge, Roanoke, Wythe, Washington and Montgomery counties, in the order named, furnish the greater part of the limestone, but it is also quarried in Alleghany, Loudoun, Rockingham, Russell, Shenandoah, Smyth, Tazewell and Wise counties. Also large quantities of lime are burned in this State, and in 1911 Augusta, Boutetourt, Frederick, Giles, Loudoun, Montgomery, Norfolk, Page, Roanoke, Rockbridge, Rockingham, Russell, Shenandoah, Tazewell, Warren and Washington counties produced 132,133 tons of lime, valued at \$536,660—\$3.66 per ton at the kilns.

Augusta, Campbell, Prince William, Pulaski and Wise counties produce the sandstone, but the quarries are all small.

Virginia has also quarries of fine quality slate, quarried in Albemarle, Amherst and Buckingham counties, with undeveloped deposits in Fluvanna county.

#### OKLAHOMA.

Oklahoma has been rapidly coming toward the front in value of stone output, which was \$801,879 in 1911, as compared with \$186,454 in 1906, an increase of 330 per cent. in five years. Limestone is produced to a larger extent than any other stone, and is chiefly for building and crushed stone. The chief producing localities are in Atoka and Comanche counties for riprap, railroad ballast and concrete, with smaller quantities from Cherokee, Coal and Johnson. Lime is burned in Delaware, Coal, Johnson and Comanche counties.

Marble is quarried at times in one locality near Marble City, Sequoyah county.

The granite deposits of Greer and Johnston counties have received considerable attention recently, and there are good indications that this stone will be a prominent factor in the wealth of the State. Other counties quarrying granite are Comanche, Kay, Kiowa and Swanson, and the stone is marketed for building, monumental, rubble and curbing stone.

The sandstone quarried in the State has been used chiefly for ballasting railroad tracks, but considerable has been used locally for building and paving, but with the continued development of the country will undoubtedly come more extended use.

#### TEXAS.

Texas in 1911 had an output valued at \$588,777, of which the greater part represents limestone quarried for building, riprap, crushed stone and furnace flux. Bell and Jack counties give a large output of crushed stone and railroad ballast; Bexar county for paving, rubble, riprap and crushed stone; Comal county for flux; El Paso, Palo Pinto and Polk counties for building, paving and crushed stone. Of less importance are Williamson and Jones counties, furnishing building, rubble and crushed stone, and 10 other counties, with small quarries for local use. Also from 40,000 to 50,000 tons of lime are burned from the limestones of this State in 10 different counties, the principal ones being Tram, Comal, Williamson, El Paso, Dallas and Coryell. There are three plants making hydrated lime.

Granite is produced in Llano, Burnett and El Paso counties, and is used for building, monumental work, riprap, curbing and crushed stone. The granites of this State have had other than local recognition and have been shipped into the Northern States. Much of this granite has been used for building the seawalls of the State, especially at Galveston.

Sandstone is at present not largely quarried in Texas, the only producing quarries being in Burleson, Fayette, Lavaca and Palo Pinto counties, with the stone used locally for building, rubble and crushed stone.

Some development work has been undertaken on marble and onyx deposits in Brewster, Kinney, Presidio and San Saba counties, but no stone has as yet been marketed.

#### ARKANSAS.

Arkansas, next to Texas in rank of the Southern States, had a stone output of \$528,947 in 1911, nearly 70 per cent. of which was granite from near Little Rock in Pulaski and Perry counties. This stone was used for building, rubble, riprap and crushed stone, most of the latter being used for railroad ballast.

Important quarries of limestone at Batesville, Independence county, and Imboden, Lawrence county, furnish the limestone of this State, sold for building stone and crushed stone. The Independence county stone supplies other than local markets. Over 25,000 tons of lime are burned annually in Benton, Washington, Izard and Independence counties.

A considerable quantity of sandstone is quarried in the State, in 10 different counties, of which White and Sebastian are the principal, furnishing stone for building, curbing, flagging, rubble, riprap and crushed stone. The other counties are Carroll, Cleburne, Conway, Garland, Izard, Johnson, Searcy and Washington.

Marble deposits are in course of development in Baxter, Boone, Independence and Newton counties, but no product of any importance has yet been realized.

Besides this, Arkansas possesses deposits of very fine slate in a belt extending across the northern part of the State through Garland, Montgomery, Polk and Saline counties. A number of quarries have been opened near Mena and Slaton in Polk county, but very little slate has been put on the market. The slate marketed has been used almost entirely for electrical purposes, although it is also good for roofing purposes. The slate in this State is found in the colors black, red, green, dark gray, etc., and is the only State besides New York where red slate is produced. Lack of transportation is the chief difficulty at present to the placing of the slate on the market.

#### SOUTH CAROLINA.

South Carolina is the last of the Southern States to have any considerable value for its stone output—\$335,617 in 1911—all of which is granite, and was quarried in Lexington, Fairfield, Richland, Greenville, Greenwood and Spartanburg counties, arranged in order of value of output. Granite quarries are located in several other counties, notably Abbeville, Anderson, Cherokee, Chester, Chesterfield, Edgefield, Kershaw, Lancaster, Lawrence, Newberry, Oconee, Pickens, Saluda, Union and York counties, but these have not recently been in operation. The South Carolina granites probably best known outside of the State are those of Fairfield county at and near Rion, which from their use as monumental and building stone have been shipped to many localities outside of the State. The Lexington and Richland county stone, quarried near Lexington and Columbia, is used for riprap and crushed stone, large quantities of this stone having been used for Government jetty work.

At Gaffney, Cherokee county, in the northern part of the State, limestone is quarried, most of which is burned into lime, and in Charleston county shell marl is burned into lime.

Some development work has been carried on at marble deposits in Oconee county, but no great amount of stone has ever been quarried.

#### FLORIDA.

Florida has deposits of shell marl and chalky limestone that is mainly utilized for the manufacture of lime, although some harder stone is quarried in Alachua, Dade and Duval counties. Lime is burned in Marion county.

Some sandstone is quarried near Montbrook, Levy county, but the stone industry of this State has never been a large one.

#### LOUISIANA.

Louisiana's claim to a commercial output of stone comes from the large limestone quarries at Winnfield, Winn parish, which have been operated for the last few years, and chiefly for crushed stone.

#### MISSISSIPPI.

As stated before, Mississippi is the only Southern State that can claim no production of stone, although there have been sandstone and limestone quarries worked at intervals for local supplies, with but very little of this in recent years.

From the above statements of the actual commercial developments of the stone deposits in the Southern States, it is quite evident that the possibilities for the continued growth of the industry are very favorable. While only the actual quarrying localities have been mentioned, there is generally room for increased development, due to the growth of the country and demand for stone outside of the usual channels of building stone. Then, too, there are numerous deposits where quarries can be opened, and will be opened when conditions demand it. A small quarry near any small town is always a source of revenue, and if transportation facilities are favorable, and the stone of satisfactory quality and quantity, a more than local trade is likely to develop. The use of stone for building and monumental work has become in this time of cheaper building materials, like brick and cement, more of a luxury than a necessity, and yet large quantities of stone are used annually for these purposes, and when this stone is subjected to a long process of polishing and carving it commands high prices. Not all stone of sufficiently good quality to be used as building and monumental stone will be selected by the architects, as there is a fashion in stones as well as in dress, and when a luxury is paid for it is always well to be in fashion. The other grades of stone, while they require certain properties of cementing value for crushed stone for road-making, certain degrees of purity of limestone used for flux, lime burning, cement-making, etc., are not so particular in regard to color, grain and physical condition of the stone, and are supplied by simpler and cheaper quarry methods.

The future of the stone industry of the Southern States will depend upon the development of the country, upon the increased means of transportation, creating a demand for the stone, which, in its turn, will aid the development, further the improvement of transportation and establish many industrial activities.

# Mining of Bauxite (Aluminum Ore) Monopolized By the South.\*

By W. C. PHALEN of United States Geological Survey.



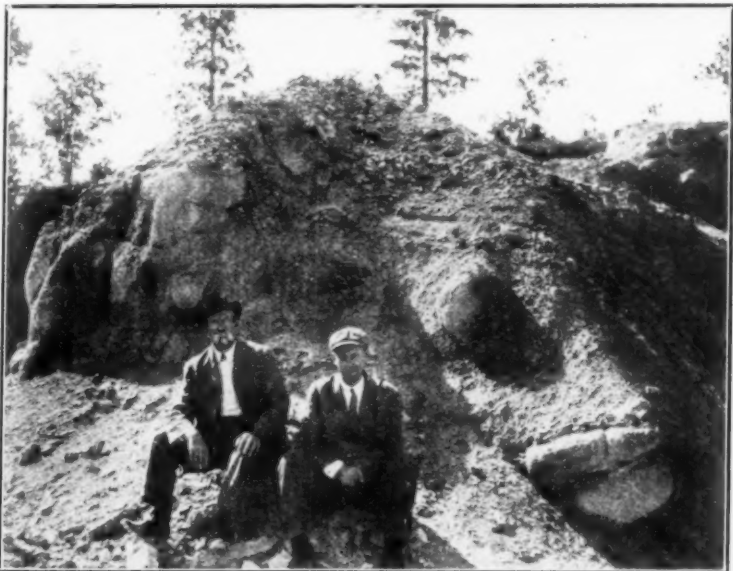
At the present time the mining of bauxite—the mineral which forms the present commercial source of metallic aluminum—is confined exclusively to the Southern States, the industry centering in Arkansas, Georgia, Alabama and Tennessee. A deposit of the mineral is also known in Botetourt county, Virginia. The magnitude and importance of this industry are apparent when it is understood that the annual production of the States named above passed the 150,000 long ton mark some time ago. For the last five years, for which there are survey records, the production of bauxite has shown small but steady increments, and the price of the ore at the mines has been fairly steady, at approximately \$5 per long ton for average grades, the richer ore running much higher in price. From part of this ore has come much, if not all, of the production of metallic aluminum in the United States. The growth of bauxite mining in the Southern States, which as stated above represents its growth for the whole United States, is given in the following table, in which the output of the State of

as the writer's knowledge goes, however, at the present time, there is no aluminum marketed which has had as its primary source clay. The production and importance of metallic aluminum alone would give to bauxite, the raw material employed in its manufacture, an important standing in the mineral wealth of the Southern States. This is, of course, the most important use of bauxite, but it has many others. In 1911, according to survey figures, there were consumed in the United States more than 23,000 short tons of aluminum. The value during the last two years (1911 and 1912) has ranged from 18.5 cents to 27 cents per pound in the form of No. 1 ingots, wholesale lots, New York city.

In addition to its employment in making the metal aluminum, bauxite is also used in making aluminum salts, of which the alums are the best known and most widely used. More than \$3,000,000 worth of alums were made in the United States during 1911, but, of course, the aluminum shales furnished the raw material for some of this product. Third and fourth uses are in the manu-



MINE AND MILL OF A BAUXITE COMPANY IN THE SOUTH.



SHOWING GRADATION BETWEEN SYENITE AND BAUXITE.



METHOD OF MINING BAUXITE.

Tennessee is combined with that of Arkansas so as to conceal individual production:

Production of Bauxite in the United States, 1889-1911, by States, in long tons.

Year.	Georgia.	Alabama.	Arkansas.	Total.	Value.
1889.....	728	.....	.....	728	\$2,366
1890.....	1,844	.....	.....	1,844	6,012
1891.....	3,301	292	.....	3,593	11,675
1892.....	5,110	5,408	.....	10,518	34,183
1893.....	2,415	6,764	.....	9,179	29,507
1894.....	2,050	9,016	.....	11,066	35,818
1895.....	3,756	13,313	.....	17,069	44,000
1896.....	7,313	11,051	.....	18,364	47,338
1897.....	7,507	13,083	.....	20,590	57,652
1898.....	.....	.....	.....	25,149	75,437
1899.....	15,736	14,499	5,045	35,280	125,598
1900.....	19,739	.....	3,445	23,184	89,676
1901.....	18,038	.....	867	18,905	79,914
1902.....	22,677	.....	4,645	27,322	120,366
1903.....	22,374	.....	25,713	48,087	171,306
1904.....	21,913	.....	25,748	47,661	235,704
1905.....	15,173	.....	32,956	48,129	240,292
1906.....	25,065	.....	50,267	75,332	368,311
1907.....	.....	.....	.....	97,776	480,330
1908.....	14,464	.....	37,703	52,167	263,968
1909.....	22,227	.....	106,874	129,101	679,447
1910.....	33,096	.....	115,836	148,932	716,258
1911.....	30,170	.....	125,448	155,618	750,649

\*Production of Tennessee included.

Experiments have been made for some time in the past on the extraction of aluminum from clay. Some of these will be alluded to farther on. So far

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facture of bauxite bricks and in making one of our newer artificial abrasives, alundum (fused alumina). Only the purer grade of bauxite, preferably that containing less than 2 per cent. iron oxide, may be used in the manufacture of alum, aluminum sulphate, and salts of aluminum in general. The abrasive, alundum, is made by the Norton Company at Niagara Falls, N. Y. It is made in an electric furnace by fusing calcined bauxite. It is high in the crystalline oxide of aluminum or alumina, and virtually amounts to a form of artificial corundum. As its quality is under control, a given standard may be duplicated with ease, a consideration of prime importance in the success of any abrasive industry. The newer uses which alundum is finding in the refractory industries should be mentioned in this place. The more extended application of alundum means a larger demand for its raw material, bauxite. Lastly should be mentioned the application of bauxite in the manufacture of calcium aluminates to give a quick set to plaster compositions.

## MINING INDUSTRY BY STATES.

The mining of bauxite in Arkansas has shown a great growth during the last few years, and this State now leads in output of the mineral. Nearly all the bauxite mined in Arkansas in recent years has come from the important deposits located near the town of Bauxite, in Saline county. The deposits are located on the Bauxite & Northern Railroad, a short spur from the St. Louis, Iron Mountain & Southern Railway, at Bauxite Junction. This spur crosses the tracks of the Chicago, Rock Island & Pacific Railroad at the town of Bauxite, and not far away from the scene of mining operations. Work has also been done recently by the Republic Mining & Manufacturing Co., not far away from Little Rock, the State Capital, located in Pulaski county.

When the writer visited Bauxite recently five important mines of the American Bauxite Co. were in active operation and a sixth had been stripped



preparatory to regular mining. During this stripping process it is customary to wash the material removed, and thus much valuable ore is saved. Stripping may reach a thickness of forty feet or more, but this is somewhat excessive, and at one of the mines it did not exceed fifteen feet or thereabouts.

In working the ore it is removed in steps or benches, when local conditions favor this method of procedure. Black powder is used to loosen it from its position in place, after which it is removed in small mine cars to the company's mill. Steam shovels are not used except for stripping. This is due to the variable character of the ore and the care that must be taken to secure as uniform an output as possible when the ore is to be used for a particular purpose. The ore is not washed at the mill, but is dumped directly from the mine cars into crushers, the character of the crushing depending on the amount of moisture present in the ore. Ore containing enough water to make it sticky is ground between two revolving crushers rotating in opposite directions. The dry ore goes through an ordinary Gates crusher. The ground or crushed ore is then conveyed to guns, or rotary kilns, similar to rotary cement kilns. These are heated with natural gas under a pressure of 150 pounds. The gas comes from the Caddo field, Louisiana. The use of natural gas as



MINE SHOWING SHARP LINE BETWEEN THE BAUXITE AND THE OVERBURDEN.

fuel is comparatively recent at Bauxite. Its installation has resulted in a considerable saving, not so much in the fuel bill, for the cost of gas is high, as in the simplicity of the firing, which does away with the services of many men. The dried ore is conveyed by a system of belt conveyors to storage bins and is loaded mechanically directly on the cars.

Three grades of ore are mined—that used in the manufacture of metallic aluminum, that used in the manufacture of alundum, and that used in the manufacture of aluminum salts. Only the ore containing less than 2 per cent. of ferric oxide ( $\text{Fe}_2\text{O}_3$ ) can be used in the manufacture of aluminum salts. The more ferruginous ore is used in the manufacture of metallic aluminum. A pure grade which may, however, carry as much as 6 or 7 per cent. of silica is set aside for the manufacture of alundum by the Norton company at Niagara Falls, New York. In the mining of the ore it has to be watched continuously. Even with much experience it is difficult to tell good ore from bad without recourse to chemical tests, and shipments have to be checked constantly.

The bauxite beds of Arkansas lie directly on kaolinized syenite and occur in undulating layers corresponding roughly to the surface of the underlying

rock. Many of the hills in the district are completely covered with the ore, which occurs on their sides as well as their tops. The ore tends to taper out rather abruptly, approaching the ravines, and in many of them it is completely absent. In thickness it varies from a knife edge to a possible maximum of thirty feet. Like the bauxite in other fields, the Arkansas ore occurs in at least three forms—the granitic, pisolitic, and the compact or clay-like form. The ore lying next to the underlying syenite is usually of the granitic type; that is, it is pseudomorphous after the syenite. The second and the third forms mentioned above are the most important, not only here, but in the other fields, which will be mentioned later.

Various theories are held as to the origin of the Arkansas bauxite. All are agreed on one point, namely, that it is genetically related to the syenite. Though important deposits of bauxite, associated with igneous rocks, are not known in other parts of the United States, occurrences of rock similar in composition to the syenite of Arkansas are not extremely rare.

The bauxite field of Northwest Georgia and of the adjacent part of Alabama is entirely distinct from that which is located in Wilkinson county, Central Georgia. The more northerly-lying field extends along the Coosa River Valley from near Summersville or Adairsville, Georgia, to Jacksonville, Alabama. The ore occurs chiefly, so far as known at the present time, in Bartow, Floyd and Polk counties, Georgia, and in Cherokee county, Alabama, and has been mined lately in the vicinity of Rome and Cave Spring, in Floyd county, and over the county line to the south of Cave Spring, in Polk county. East of Floyd county the ore has been mined near Halls (Linwood Postoffice) and Kingston, Bartow county. In Alabama, Rock Run, Cherokee county, is the center of the mining industry.

The bulk of the bauxite deposits in this field, and the few known farther north in Tennessee, are studied to greater advantage when a part of their ore has been removed. Under such conditions their relationships can be more readily discerned. Most of the mines in this field and near Chattanooga, Tennessee, consist simply of rounded or ellipsoidal deposits a few hundred feet in diameter at the surface and tapering roughly to a point as they descend. None of them are more than a few hundred feet deep at the most. The ore is worked out in open pits or cuts. The overburden is first stripped away and the ore is loosened with black powder or dynamite; further loosened with pick or crowbar and shoveled into small mine cars. It is then raised to the washer or dryer on an incline. The ore, which contains a large amount of clay, is crushed and washed usually in a log washer. The ore usually contains a large amount of mechanically held moisture. To remove this and thus reduce freight charges, the ore is dried in slightly inclined rotary cylinders. The ore is fed continuously at the upper end of these cylinders and emerges from the lower end, where the heat is supplied. After this preliminary treatment the ore is ready for shipment.

The deposits in the Georgia-Alabama field usually occur in the residual clay derived from the weathering of dolomite or limestone. The calcareous rocks overlie a great mass of shale and numerous faults intersect the rocks. The origin is believed to be due to surface waters which reached the shale and oxidized its content in pyrite, thus setting free sulphuric acid. This reacting with the alumina of the shale formed sulphate of aluminum. Ascending currents carried the sulphates in solution upward to the surface, where, in contact with the limestone during their upward passage, they were decomposed and aluminum hydrate or bauxite was formed. Whatever the origin of the deposits may be, the almost constant association of limonite or iron ore and kaolin is worthy of mention, and may be, therefore, an important clue in locating other deposits.

The deposits are, as indicated, comprised in one field so far as the structural and geologic relations are concerned. When it is considered (1) that the same type of rocks extends considerably farther north into Tennessee, and (2) that not the whole of the district or even the major part of it has been thoroughly prospected, it is more than probable that new, and what may prove to be large and important deposits, will be discovered from time to time in the future.

Bauxite occurs in Wilkinson county, Central Georgia, and was mined the past year near McIntyre, on the Central of Georgia Railway. The deposits are not related geologically with those found in the northern part of the State, nor is there any geographic connection with them. They are 150 miles from those deposits and are near the margin of the coastal plain. Macon is the nearest important city, located 30 miles to the west.

The first shipment of bauxite from the Wilkinson county field was made in the summer of 1910 by the National Bauxite Co., and exploitation has been in progress since that time.

Like the bauxite from the other and older Southern fields, the Wilkinson county ore is either oolitic, that is, it contains small rounded or concretionary grains smaller than the size of a pea, or pisolitic, in which the grains are of pea size or larger. Pebble ore also is found in which the rounded or concretionary masses range in size from small to large pebbles. Amorphous ore, that is that which resembles ordinary gray or drab clay, is also found. This latter ore may be dense or even flinty in appearance. The ore is generally hard, but soft clay-like varieties are also known. In color it varies from a white or cream to a bright red. An average of fourteen analyses, made by Edgar Everhart while connected with the Geological Survey of Georgia, shows that it contains 55.06 per cent. alumina ( $\text{Al}_2\text{O}_3$ ), 5.80 per cent. iron oxide ( $\text{Fe}_2\text{O}_3$ ), 6.84 per cent. silica ( $\text{SiO}_2$ ), 2.18 per cent. titanium oxide ( $\text{TiO}_2$ ), 28.32 per cent. water of constitution, and 1.32 per cent. moisture—the last figure being the average of eleven analyses.

Though the ore is known only in Wilkinson county, the conditions of its occurrence are not confined to this county alone, but are common in Twiggs, Washington, Glascock, McDuffy and Richmond counties, and the deposits may be found in any or all of these counties if carefully looked for. The most likely places to search are near the contact between the white clay beds,

locally known as the "chalk" beds, and the overlying red sands and impure clays.

The National Bauxite Co. has been mining bauxite during the past five years on the east side of Missionary Ridge, near Chattanooga, Tennessee. The locality where operations are conducted may be reached by taking a trolley car to Sherman Heights, from which the deposits are easily reached on foot. The tunnel of the Southern Railway pierces the Ridge not far to the north of the mine.

The pit where the ore is being mined does not differ in any essential features from those farther south in the North Georgia-Alabama field. The geologic and structural relations will probably prove to be identical with those in this older and better known field. The ore is found in or near a dolomite, known to geologists as the Knox dolomite, a rock whose outcrops are characterized usually by a large amount of chert strewn about on the surface, this enabling it to be readily identified, and occurs near a fault line or line of dislocation in the earth's crust along which the Knox has been thrust over from the southeast upon other formations lying to the northwest and which are not so rich in chert. The extension of the ore into an area so far north of that already known indicates a strong probability that in the intermediate territory deposits may exist and will be found in the future, and that also to the northeast of Chattanooga, where the same type of rocks and structure are found, deposits of the ore will be found in paying quantities as time goes on.

#### USE FOR LOW-GRADE BAUXITE.

One of the hopeful signs for cheaper aluminum in the future is to be found in the interest growing more and more manifest in the preparation of pure alumina (the immediate source of the metal) from clay. It is hardly necessary to state here that aluminum silicate (clay) is one of our most

widely distributed substances. The purer grades, that is, those containing little or no iron oxide, sand, titanium oxide, etc., are however not so common, but it is believed that it is not wide from the truth to state that as compared with our known deposits of bauxite they may be classed as abundant. When a successful process for the extraction of metallic aluminum from clay is placed on a commercial basis, the large quantities of low-grade bauxite, that is, the mineral containing admixtures of clay, may be expected to assume commercial importance. There is a large tonnage of such ore associated with most of the Southern Appalachian deposits, and these should attract attention and be experimented with before the lower-grade non-bauxite bearing clays are utilized.

Without mentioning the recently patented processes for the extraction of alumina and potash salts from feldspar, attention may be called to two processes for obtaining alumina from clay. One of these is known as the Cowles process and the other is that of Childs, from their respective inventors, Alfred H. Cowles and David H. Childs. In the Cowles process clay is mixed with salt and carbon in the form of charcoal or sawdust and the mixture fashioned into perforated briquettes. The carbon is not added for its chemical, but for its physical effect, as during the process it burns out, leaving a porous mass. The briquettes are first kiln-dried and then heated to a high temperature and are treated with a measured amount of exhaust steam and a limited quantity of air. Sodium silico aluminate and hydrochloric acid are the valuable products formed. The first substance mentioned is then treated with lime, either in the anhydrous form, or as limestone, calcite or marl. The calcium silicate which forms is used as a cement material after suitable treatment. From the sodium aluminate, which is obtained in solution, caustic soda and alumina are secured by methods already in use. In the Childs process the clay is converted into aluminum fluoride, which, when calcined, yields alumina and hydrofluoric acid, which is used over again.

## Clay Products and Clays of the South

By JEFFERSON MIDDLETON of the United States Geological Survey.



THE population of the South constitutes about 35 per cent. of the total of the entire country. The value of the clay products of the Southern States in 1911 constituted about 18 per cent. of the entire country. It is fair to assume that the consumption per capita of clay products in the South should be about the same as that of other portions of the country. If so, this means that the South either imports a large proportion of its consumption of clay products or that it does not use as much in proportion as other parts of the country. If either of these conditions be true, the clear inference is that there are great opportunities in the South for the clay-working industries. If the consumption of clay products in the South is greater than the production, which is unquestionably true, the principal reasons being the abundance of lumber and climatic conditions, which make wooden buildings predominate, then there is no reason why the South should not produce all of the clay products that it consumes, as it has a plentiful supply of raw materials for the production of all varieties of clay products, cheap fuel, an ideal climate for clay working and ample labor, especially for the coarser grades of clay products. If the consumption of clay products is less per capita than the average, then there is a great opportunity to educate the people in the use of the most enduring, the most artistic, the most truly economical of all building materials—burned clay. It may be considered that the South has reached its maximum production of clay products, and that it must continue to import the most of the clay wares that it uses. This condition is far from the truth. There is no region of the country better supplied with valuable clay deposits. Almost every geologic age and every variety of clay are represented in the clays of the South, from the loess of the Mississippi and Missouri River Valleys to the kaolins of the pre-Cambrian of the Appalachian region. The South is today the principal source of supply of the highest grade clay kaolin or china clay. It occurs in nearly every one of the Southern States, though the deposits are worked in but few. Of the kaolin produced in 1911, over one-half was produced in the South.

One naturally thinks of the kaolins or china clays as possessing the best opportunities for development on account of the high value of these clays. But after all, their value is small compared with that of the commoner varieties, and the greatest opportunities for the development in the South lie in the utilization of its vast stores of clays suitable for the manufacture of structural and engineering materials. The growth of the South in population will naturally increase the demand for such building material as brick of all kinds, terra-cotta, fireproofing and of vitrified brick for paving the streets of the cities and the country roads, tile for farm drainage and sewer pipe for culverts and sewage disposal. Roofing tile, owing to its insulating properties, should also be manufactured extensively in the South. At present there are plants making this material located in only two Southern States—Georgia and West Virginia.

Of the clay mined and sold as such in the United States in 1911—2,182,698 short tons, valued at \$3,480,763—the Southern States reported 681,534 tons, or 31.2 per cent., valued at \$1,454,883, or 41.8 per cent. of the total. When the high-grade white burning clays are considered, however, the South shows its great importance. Of the total quantity of these clays produced in 1911, the Southern States reported over 80 per cent., and 75 per cent. of their value. Practically all of these clays are shipped to the North to be manufactured into wares, and in the development of industries to utilize these high-grade materials lies one of the South's greatest opportunities. In fact, the establishment of potteries making high-grade ware is one of the crying needs of the South.

The South produced in 1911 pottery ware valued at only \$3,703,542, or 10.7 per cent. of the total, and of this two border States, Maryland and West Virginia, reported pottery valued at \$3,134,613, or 84.6 per cent. of the entire output of the South. All the other Southern States reported only 1.6 per cent. of the pottery produced in 1911, and none of this was high grade. In other words, the Southern States, with 35 per cent. of the population of the country, are producing less than 11 per cent. of the pottery products of the country. With its supplies of raw materials and its manufacturing facilities, it should be producing at least its quota of the pottery products of the country.

When the coarser and in the aggregate more valuable and more abundant clay products are considered—the structural and engineering materials—the conditions are not much better than with the pottery. The value of these materials produced in the South in 1911 was \$29,741,224, or 18.3 per cent., or about one-half of its consumption.

It has been said that Americans are the only civilized people more than half of whom live in wooden houses. It seems now, however, the day is at hand when more substantial construction will be demanded, not only by reason of the increased cost of lumber, but on account of the greater protection from fire, the reduced cost of maintenance, and there is no material fitted to fulfil this demand so well as burned clay products. The South is well equipped to be in the forefront in this new building movement, with its widespread building brick clays of the Coastal plain and its shales of the highlands. In the development of these clays and shales for the manufacture of building brick lie great opportunities in the South to meet the demand to be created by this new building movement.

Another clay product for which there seems fine possibilities is the development of the drain-tile industry. The great agricultural States of the Middle West have long been large users of drain tile. In the South there are many lowlands which could be reclaimed and made fertile by the use of drain tile.

The production of fire-brick in the South is more in proportion to its demands than most other clay products, but there will be opportunity for development of this industry as the coal and iron industries of the South increase in importance.

The South produces only about one-third of its consumption of face-brick and a much less proportion of its terra-cotta. Here are also great opportunities for development. With growth of the cities of the South there will be a demand for high-grade face-brick and architectural terra-cotta, as the raw materials for these products are abundant there.

One of the best opportunities for development in the South is in the manufacture of vitrified paving brick. Vitrified paving brick is unquestionably one of the best and most economical paving materials known. It is advantageously used not only for cities and towns, but is especially well suited for country roads. It is largely used for this purpose in the North, and is giving general satisfaction. The shales of the Southern States are well adapted to the manufacture of paving brick.

The production of fuller's earth in the United States is almost exclusively a Southern industry. With the exception of a few scattered deposits in the North, Northwest and on the Pacific Coast, all of the known domestic deposits of this material are in the South. Of the seven States reporting fuller's earth in 1911, five were in the South, viz., Arkansas, Florida, Georgia, South Carolina and Texas. It occurs also in Alabama, Missouri and Virginia. These States reported 98 per cent. of the quantity and value of the output of the country, Florida alone reporting 68 per cent. of the quantity marketed in 1911.



This State has been the leading fuller's earth producer since the beginning of the industry there in the early nineties.

The principal, if not the only use of this material, is in the bleaching or clarifying of oils, fats and greases. The growth of the petroleum industry will naturally stimulate the production of fuller's earth, not only from known deposits, but should lead to the discovery of new deposits. Arkansas, Florida and Texas offer good opportunities for the development of this industry. Descriptions of some of the deposits in Arkansas and Texas are contained in Bulletins Nos. 530 and 470, respectively, of the United States Geological Survey.

The use of the American earth has been principally in the filtering of mineral oils. Its use in vegetable oils is on the increase. This use offers a considerable field for the domestic material.

The following is a brief résumé by States of the clay resources of the South. In making a comparison by per capita value of clay products it has been sought to show the present deficiency of the South in the production of these wares and conversely show the opportunities for their development. The per capita value of clay products for the whole country in 1911 was about \$1.75. For the leading clay-working States it was: Ohio, \$6.85; Pennsylvania, \$2.64; New Jersey, \$7.16; Illinois, \$2.54; New York, \$1.11. The highest of any Southern State was West Virginia, \$3.54, and the next highest, Missouri, \$1.91.

**Alabama.**—Alabama is rich in clay resources, kaolins, fire clay, shales and loam suitable for the manufacture of building brick abounding. But, as in most of the other Southern States, they are little developed. The residual kaolins and fire clays are found in the northeastern portion of the State, stoneware and fire clays are found to the south of these residual clays, and the southern portion of the State contains valuable clays that are not worked. Alabama in 1911 was sixth among the Southern States in the value of clay products, their value being \$1,947,102, or about 91 cents per capita. Alabama ranked seventeenth among the clay-working States of the country. This State is possessed of many valuable clays, yet its clay-mining industry is insignificant, the clay mined and sold as such in 1911 being valued at but \$29,909.

**Arkansas.**—The clays of this State are but meagerly developed, though clays of all kinds, from kaolin to common brick clay, are found within its borders. The region around Little Rock seems to have clays of great value. The clay products of Arkansas in 1911 were valued at \$180,643, or about 31 cents per capita. There are great possibilities for the development of the clay-working industries in Arkansas. This State ranked fifteenth in value of clay products among the Southern States.

**Florida.**—The clays of Florida are of comparatively small importance, though the white-burning ball clays (or plastic kaolins) of this State are used to a considerable extent in the manufacture of high-grade pottery. The value of these clays shipped in 1911 was \$114,751. The value of Florida's clay products in 1911 was \$217,535, or 29 cents per capita, the lowest of any Southern State.

**Georgia.**—Georgia is one of the richest of the Southern States in clay. In the northwestern corner of the State occur white residual clay and shales. These are not at present utilized, but should form the basis of a prosperous industry. The Coastal plain, from the fall line to the sea, is very rich in clay. These clays range from the white-burning clays, or "plastic kaolins," near Macon, and which are used in the manufacture of paper, fire-brick and pottery, to the common brick clays of the coast. Sewer pipe, fire-brick and low-grade pottery are made at various points from local clays, and roofing tile is made from clays in Liberty county. Georgia's clay products in 1911 were valued at \$2,636,380, or \$1.01 per capita. Georgia's rank among the Southern States in the value of clay products was fourth, and in the United States thirteenth. During the same year Georgia shipped 68,161 tons of clay, mostly of the plastic white clay, valued at \$223,462, and was second among the Southern States in the value of clay shipped, and fourth in the United States.

**Kentucky.**—The most valuable clays of Kentucky are the fire clays occurring in the coal measure beds, which are found in both the eastern and western portions of the State. Fire clay also occurs in Carter and Greenup counties, and accompanies many of the coal seams of Jackson, Pulaski, Laurel and Rockdale counties. Brick clays are located in many parts of the State. Kentucky's clay products were valued at \$2,368,094, which was \$1.03 per capita. Kentucky's clay-mining industry is important. In 1911 the clay shipped was valued at \$126,457, this State showing the largest increase in production and value of clay marketed in the entire country. Its rank in the value of clay products was fifth among the Southern States, and fourteenth in the United States.

**Louisiana.**—The clay-working industry of Louisiana is at present of comparatively little importance. There appears to be good opportunities for the development of the brick-making industry from the clays along the Mississippi and other rivers of this State. Its clay products, almost exclusively common brick, were valued in 1911 at \$531,949, or 32 cents per capita. There were but two Southern States with a lower per capita than this. Its rank in the value of clay products was fourteenth among the Southern States and thirty-fourth in the United States.

**Maryland.**—This State is rich in clays, which range from high-grade kaolin to common brick and earthenware clay. The kaolins of Cecil county and the fire clays of the Mount Savage region are probably the best known of the Maryland clays, though other valuable clays suitable for the manufacture of sewer pipe, vitrified brick and other clay products occur in a belt running northeast and southwest from the State line to the District of Columbia, and brick clays and shales abound throughout the State. Maryland's clay products are varied in character. This is one of the two Southern States that report high-grade pottery. Enamelled brick are also produced in this State. The largest clay-working center of the State is Baltimore and vicinity. Its clay products in 1911 were valued at \$1,772,434, which was \$1.37 per capita, this per capita being exceeded by but two other Southern States—West Virginia and

Missouri. In 1911 its rank in the value of clay products was seventh among the Southern States and eighteenth in the United States.

**Mississippi.**—The clay-working industries of Mississippi are of minor importance, its clay products being valued in 1911 at \$687,836, or but 38 cents per capita. These industries are capable of much greater development, as clays and shales suitable for the manufacture of almost all varieties of clay products are found in this State. In the northeastern portion of the State clays and shales occur suitable for the manufacture of building, paving and fire-brick, and for sewer pipe and tile, and the western portion of the State contains loams suitable for the manufacture of common brick. Mississippi's rank as a clay-working State in 1911 was twelfth among the Southern States and thirtieth in the United States.

**Missouri.**—Missouri is the leading Southern State in the manufacture of clay products and in the variety of clays found within its borders, practically all kinds of clay, from common brick clays to kaolin, being found there. The kaolins have been worked but little, and that only in one of the three known localities. The fire clays of the State are important, the plastic clays of the St. Louis district being exceptionally high grade, and flint clays of the central portion of the State are also highly refractory. Shales suitable for the manufacture of paving brick, sewer pipe, roofing tile, terra-cotta and fireproofing are found in the coal measures. The loess clays, suitable for the manufacture of paving brick by the dry press process, occur in almost inexhaustible quantities along the Missouri and Mississippi rivers, and brick clays and shales are found in many other parts of the State. The clay products of Missouri in 1911 were valued at \$6,274,353, which was \$1.91 per capita, the highest of any Southern State, except that of West Virginia.

The clay-mining industry is also important in Missouri, there having been sold in 1911 227,691 tons of clay, valued at \$512,088. This was over one-third of the quantity and value of all clay sold in the Southern States.

Missouri's rank as a clay-working State was seventh in the United States in the value of products and third in value of clay mined.

**North Carolina.**—North Carolina's most interesting clay resource is its residual kaolins, which are the most important mines of this material in the country. More than one-half of all the kaolin marketed in 1911 was produced in the western part of North Carolina. Much territory in this region has not been even prospected, and no doubt other deposits will be discovered in this region. The sedimentary clays of this State occur throughout the Coastal plain, and are usually only suitable for brick-making, though sometimes they are used for the low grades of pottery. At Pomona and Grover they occur as a semi-fire clay, and at the former place a weathered shale has been used for making sewer pipe. The clay products of this State in 1911 were valued at \$1,280,126, or 58 cents per capita. It was tenth in value of clay products among the Southern States and twenty-fourth in the United States.

**Oklahoma.**—The clay products of Oklahoma were valued at \$1,657,155, or 46 cents per capita, in 1911. This State is well supplied with clays and cheap fuel for burning them, coal, oil and natural gas being plentiful. With the rapid growth in population, the clay-working industries offer many opportunities for development. Its rank in 1911 in the value of clay products was eleventh in the Southern States and twenty-ninth in the United States.

**South Carolina.**—South Carolina's principal claim to recognition as a clay-producing State lies in its deposits of white plastic clay, found near Columbia, Aikin and at other points. This material is used chiefly in paper-making. In 1911 30,640 tons of it were marketed, valued at \$120,012. As a clay-working State South Carolina is of minor importance, its clay products being valued at \$669,794 in 1911, or about 44 cents per capita. It ranked thirteenth among the Southern States in value of clay in 1911 and thirty-first in the United States.

**Tennessee.**—Many varieties of clay are found in this State, ranging from ball clay to that suitable for common brick. The principal clay mined in the State is the ball clay of Henry county. No kaolin has been found in Tennessee, though it may be discovered in the northeastern part of the State, as it has been found in adjoining parts of North Carolina. Clays suitable for brick and tile are found in many parts of the State, and fire clays occur in Fayette, Henry, Knox, Madison, Rhea and Weakley counties. Tennessee's clay products in 1911 were valued at \$1,335,100, or about 63 cents per capita. In value of clay products it ranked ninth among the Southern States and twenty-third in the United States.

**Texas.**—Texas is well supplied with clay. In its eastern portion the clays correspond with those of the Atlantic Coastal plain, and in addition there is along the coast a strip of littoral deposits which furnish material for good brick. To the west of the Coastal clays, from the Sabine River to the Rio Grande, occur clay beds of great thickness that weather a pure white, and may be valuable in the manufacture of pottery, tile and brick. In northern Texas shales, clays and so-called marls are used in the manufacture of building and paving brick and pottery. Shales are found in Webb county in connection with the coal beds, and are used at Laredo for making brick. A deposit of very high-grade kaolin occurs near Leakey, Edwards county, but lack of transportation facilities has prevented its development. Texas was third among the Southern States in value of clay products in 1911 and twelfth in the United States, its wares being valued at \$2,659,919, or 68 cents per capita.

**Virginia.**—Virginia's principal clay resources are found in the Coastal plain, which furnishes clay suitable for the manufacture of brick, the chief centers being near Washington, D. C., and near Richmond. Kaolin occurs in Henry and Patrick counties, but none is now being produced. Virginia's clay products were valued at \$1,739,900 in 1911, or 84 cents per capita. Virginia was eighth in value of clay products in 1911 among the Southern States and nineteenth in the United States.

**West Virginia.**—The clays of this State are, with the exception of a few lake and river deposits, all in the older geologic formations. Shales and fire clays occur in many places, and are worked for fire-brick in Piedmont, Mineral county; for fire-brick, paving brick and sewer pipe in Hancock and Taylor

counties; for paving and fire-brick in Taylor county. These clays are also found in Kanawha and Monongalia counties. In Cabel county clays and shales occur that are suitable for a number of purposes, including roofing tile. Shales are also worked in Harrison, Marshall and Mason counties, and along the Ohio River is a series of clays and shales that are suitable for clay working, but have been utilized only at Parkersburg for roofing tile. The river clays are used in the valleys of the Ohio and Potomac rivers for building brick.

Judging from the quality and quantity of the clays of West Virginia, its nearness to centers of population and the abundance of fuel, no State offers better opportunities for the development of a prosperous industry.

West Virginia's clay products in 1911 were valued at \$4,333,420, or \$3.51 per capita, by far the largest per capita of any other Southern State. About two-thirds of this, or \$2,880,202, was high-grade pottery using no West Virginia clay.

## Copper, Lead and Zinc in the Southern States\*

By C. E. SIEBERTHAL of the United States Geological Survey.

**Q**UES of copper, lead or zinc were mined in seven Southern States in 1911. The copper ores produced contained 9790 short tons of metallic copper, worth, at the average New York price, \$2,447,586, the output constituting a little less than 2 per cent. of the total copper production of the United States for the year. The lead ores produced contained 181,911 short tons of lead, worth, at the average price, \$16,372,059, and forming 42 per cent. of the lead output of the country in 1911. The zinc ores mined yielded 130,717 short tons of metallic zinc, having a value of \$14,901,796, and forming 41 per cent. of the total yield of the country. These figures, taken from the annual statistical report of the United States Geological Survey for 1911, are the latest accurate figures now available to show the production of these metals in the Southern States, but close estimates of the output of the South for 1912 are included in notes given below. The production of these metals by individual Southern States is shown in the following table:

COPPER, LEAD AND ZINC PRODUCED BY SEVEN OF THE SOUTHERN STATES DURING 1911, IN SHORT TONS.

	Copper.		Lead.		Zinc.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.
Virginia.....	45	\$11,250	417	\$37,563	1,113	\$126,920
Tennessee.....	9,425	2,356,285	.....	.....	1,117	127,358
Kentucky.....	.....	.....	.....	.....	158	18,012
Missouri.....	320	80,051	178,868	16,098,120	122,515	13,966,710
Oklahoma.....	.....	.....	2,501	225,090	5,150	587,100
Arkansas.....	.....	.....	64	5,760	664	75,636
Texas.....	.....	.....	61	5,526	.....	.....
Total.....	9,790	\$2,447,586	181,911	\$16,372,059	130,717	\$14,901,796

### VIRGINIA.

Although the actual output of lead and zinc in 1912 was practically the same as in 1911, there were some very interesting developments during the later year, particularly in connection with the pyrite deposits of Louisa county. The iron ores of the pyritic belt have long been known to carry zinc, and the blast furnaces working these ores have required frequent barring to free the "cadmia," or encrusting lumps of zinc oxide. Such zinciferous barrings and furnace dusts from the neighborhood of Pulaski have been shipped to the Bertha zinc furnace in previous years at the rate of a carload or two annually. The pyritic ores of Louisa county have always carried a certain quantity of copper, lead and zinc. The copper has customarily been recovered as cement copper from the mine waters, but at the Arminius mine copper, lead and zinc sulphides have at times been separated in a small way and shipped. But in general these ores, in default of a suitable concentration plant to prepare them for market, have gone to the storage dump and middlings stack. The deposit is worked by a shaft on an incline of 60 degrees, which has reached a vertical depth of 1200 feet. It is reported that very recently a new ore body west of and parallel to the deposit now worked has been encountered in a cross-cut at the 1000-foot level. The ore is said to consist of lead and zinc sulphides and to have a valuable silver content. It is further reported that a large tract of land in line with the trend of these recent developments, but several miles northeast of them, has been optioned to a large zinc-smelting company at a high figure. The ore on this tract is said to be similar to that heretofore mined, carrying iron, lead, zinc and silver. On the whole, it seems fairly certain that a considerable output of lead and zinc ores will soon be coming from this district.

Another district which has recently become active is the Rye Valley area. Two companies, one represented by S. W. Osgood, who is largely responsible for the recent revival of zinc mining in Tennessee, are reported to have taken options on all prospective territory in the Cedar Springs-Rye Valley district of Wythe and Smyth counties.

### TENNESSEE.

The copper mines and smelters of the Ducktown district in 1912 made their usual large output of copper and sulphuric acid, the latter having been absorbed by the fertilizer manufactories of the South.

The production of zinc ore in Tennessee in 1912 was practically double that in 1911, although one of the large companies, the American Zinc Co. of Tennessee, spent the year in construction and development work. A 1000-ton concentrating plant was begun, and the Holston shaft reached a depth of 380 feet. Another shaft will be sunk to a depth of 1000 feet. A large quantity of milling ore has been blocked out by drilling and by underground development work, and the aim of the company, like that of the parent company in the Joplin region, will be

to reduce operating costs per ton by large tonnage and steadiness of operation. The American Metal Co. is prospecting the old Edes, Mixer & Heald Mossy Creek mines at Jefferson City, and the New Jersey Zinc Co. and the Federal Lead Co. are reported to have taken options on other territory with a view to prospecting. Thus there are five large smelting companies interested in the district, which insures that the extent and value of the ore deposits of the area will receive an adequate test.

The Tennessee Geological Survey has recently published a timely report on these deposits. From this report we learn that the sphalerite now mined carries from 62 to 66 per cent. of zinc, from 0.22 to 0.55 per cent. of iron, and never more than traces of lead and copper. The smithsonite ores contain from 0.33 to 1.10 per cent. of iron and only traces of lead and copper. As the iron will distill over only in small quantities in reducing the zinc, such ores should yield an extra quality of spelter, free from lead and copper, and therefore should command a premium price.

The Edes, Mixer & Heald zinc smelter at Clinton, Tenn., in operation from 1890 to 1893, made a high grade of spelter, two assays quoted by Tennessee Survey's preliminary report being as follows:

ASSAYS OF CLINTON SPELTER.

	I.	II.
	Per cent.	Per cent.
Zinc.....	99.723	99.988
Lead.....	0.238	0.017
Iron.....	0.039	.....
	100.000	100.000

The ore reduced at this plant came in part from the Lead Mine Bend area on Powell River, where the deposits are mixed zinc and lead, and in part from the Holston River area, in the ores of which there is only a trace of lead. This accounts for the differences in purity of the product.

Spelter having the first assay would rank very nearly up to the second highest standard grade established by the American Society for Testing Materials, and spelter having the second assay would easily rank as metal of the highest grade. The natural market for such spelter is in the brass-working districts of the East, notably in Connecticut, whereas the commoner grades of spelter, mainly used for galvanizing, find their chief market in the Pittsburgh district. The zinc ores now shipped from Tennessee are smelted with natural-gas fuel in West Virginia. The concentrates produced by the new mill of the American Zinc Co. of Tennessee will be smelted in a coal-fired plant at Hillsboro, Ill. Most of the smelters in Illinois are on land that is underlain with coal which can be laid down at the smelter at mine-mouth prices. Such plants have an advantage of about \$4 in freight and other charges on the three tons of coal necessary to reduce one ton of zinc sulphide ore. This disadvantage of the Tennessee zinc field will tend to divert the metal made from Tennessee ores to Western markets, and may result in its being used to mix with low-grade Western ores to raise the composition of the resulting metal. In the event that electrothermic zinc smelting becomes successful, the construction of large hydro-electric plants in Eastern Tennessee may lead to the development of a local smelting industry. The demand for sulphuric acid in the fertilizer industry of the adjacent Southern States ensures a market for that profitable by-product of zinc smelting.

### WESTERN KENTUCKY-SOUTHERN ILLINOIS DISTRICT.

The lead and zinc mines of the fluorspar district in Kentucky and Illinois had a prosperous year, owing partly to great activity in the fluorspar industry. The zinc production of Kentucky was more than trebled over that of 1911, reaching the largest figures in recent years. At the same time the production of lead was larger. The operation of the large fluorspar mills in Southern Illinois resulted in an increase of 50 per cent. in the lead production of that district.

### SOUTHEAST MISSOURI LEAD DISTRICT.

The output of lead by the disseminated lead district of Southeast Missouri was slightly larger than in 1911, and it thus remains the most important lead district in the United States, notwithstanding its record of nearly 200 years of production. Most of the companies, by means of diamond drilling, have blocked out ore reserves sufficient for several years' operations, so that it seems likely that the district will hold out the premier position for a number of years to come. The yield of lead for the year was about 150,000 tons, approximating a third of the production of the country for 1912. The feature of the year was the increase of milling capacity by improvements and additions at the newer, larger plants and the abandonment of the smaller out-of-date plants with the object of attaining smaller unit costs. Increases were made or are under construction by practically every operating company except

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the Desloge Consolidated Lead Co., which reconstructed its mill a year or so ago. The Alma shaft of the Potosi Mining Co., finished in 1911, but never operated, was connected with the railroad by a spur, and will be a producer during the coming year. The Federal Lead Co. leased and operated the Catharine mine, which had been idle for several years. The same company erected a small trial magnetic separating plant to treat pyrite-blende-chalcopryrite middlings, considerable quantities of which are now being produced from ores from the deeper horizons. Small shipments of copper concentrates have been made, in addition to which some of the copper contents of the lead concentrates has been recovered as matte at the lead smelters treating the Southeast Missouri lead ores. Zinc middlings have been stored at one or two plants, but none have yet been marketed. In times this metal also will doubtless become a by-product of the deep-lead mines.

#### JOPLIN DISTRICT.

The value of the output of the lead and zinc mines of the Joplin district, comprising the southwestern part of Missouri, the Southeastern part of Kansas and the Northwestern part of Oklahoma, as reported by local authorities, was greater by over \$2,500,000 than ever before in the history of the district. This large output was due to the prevailing high prices of zinc concentrates during the year, for the actual production of zinc ores, though greater than in 1911, was less than the record figures established in 1909. The output of zinc blende concentrates by the district was approximately 280,000 tons, and of zinc silicate and carbonate ores about 19,000 tons, the yield of metal being nearly 40 per cent. of the whole production of the country. The production of lead concentrates was near 45,000 tons. As a result of the high prices the sheet-ground mines of the Oronogo-Webb City-Duenweg belt and elsewhere produced a large share of the total output. The very productive region about Thom's Station, opened up in 1911, continued on even a larger scale in 1912. A very promising territory was opened up in Kansas along Spring River, southwest of the old camp at Badger. In the Oklahoma portion of the Joplin region the feature of

1912 was the opening up of deeper levels of ore, which necessitated the installation of the heaviest pumping machinery ever brought to the district. Development work was very active.

#### NORTH ARKANSAS.

The production of zinc ores in the North Arkansas district made a good gain over that of 1911 and about equaled that of 1909, which was the banner year of the district for the period covered by official records. According to local authorities the output of zinc concentrates in 1912 was a little over 1800 tons. The production of lead concentrates was very small. The steady progress in production for the last six years argues a like growth in the future.

#### ZINC SMELTING INDUSTRY OF THE SOUTH.

Reference has been made herein to the quality of spelter made at the Clinton (Tenn.) smelter from 1890 to 1893. For many years the Bertha Mineral Co. operated a smelter at Pulaski, Va., producing the famous Bertha Pure Spelter. In 1911, however, this old smelter was abandoned and dismantled. One of the first zinc smelters to be established in the Middle States was built in 1857 at Calamine, Sharp county, Arkansas, operations continuing until stopped by the Civil War. A second zinc smelter at the same place was operated in 1871-1872. The discovery of natural gas in Kansas, and the cheapness of that fuel and its suitability for zinc smelting, led to that State becoming the zinc-smelting center of the country. The waning of the Kansas gas fields in late years and the developing extent of Oklahoma gas fields have resulted in a migration of zinc smelters to Oklahoma, so that the close of 1912 finds Oklahoma with the greatest zinc-smelting capacity among the States, having a total of 27,416 retorts, as against 27,092 active retorts in Kansas and 25,148 retorts in Illinois. The close of 1912 also finds Oklahoma with the largest zinc smelter in the country, the plant of the Bartlesville Zinc Co. at Collinsville, having 8064 retorts; the next largest zinc smelter is that of the Grasselli Chemical Co. at Meadowbrook, W. Va., with 6912 retorts.

## Turning "Run Down" Farms and Plantations Into One of the South's Greatest Assets

By W. H. HARRISON, JR., Mansfield, La.



FEW months ago the writer had the pleasure of an all afternoon talk with a man on his way home from a land hunting trip in the South. He owns two farms within one hundred miles of Chicago, one of which he can sell for \$250 per acre, the other not quite so valuable. The following conversation ensued:

"Bound for home?"

"Yes."

"Been hunting land?"

"Yes."

"Find anything to please you?"

"No, this country doesn't look good to me."

"Want to buy some cheap land?"

"I thought I would, as our two farms are not large enough for all of our big family of boys coming on."

"Don't you know that you cannot buy cheap land in a country that looks as good as Illinois? If you want to get into sections where things have the same prosperous looks as they have in the Northern States, go into the sugar belt of Louisiana or into sections of South Carolina where lands are worth \$150 per acre, and you will find things looking very different from the sections where lands are cheap. You should be glad that things do not look any better, as you can make better investments and can make a lot of money while doing your part toward the change in looks that is bound to come."

This man had been down to a well-boomed spot where they wanted \$45 per acre for wild cut-over pine lands. I told him if he wanted wild lands he can find millions of acres for sale just as good as the lands he had been inspecting for \$10 per acre or less, and for \$15 to \$25 per acre more they can be made into prairie. When asked if he had looked at any plantations, he said: "No, except what I have seen from the train, and all I have seen have had such a 'run-down-at-the-heel look' that they do not appeal to me."

Here is a sample of thousands of prospectors who come South and return disgusted, deceived by appearances, because they do not look into matters deep enough so they have any sort of correct idea of the opportunities they are passing by. I am writing article, hoping that the line of argument that induced this man to return later and invest in a large plantation may be of some benefit to those of your readers who are planning to come South on a land hunting trip.

I called this Illinois farmer's attention to the country we were then passing through, and told him: "You can buy plantations right along here at \$12 to \$25 per acre, and you can make more net cash money from each acre, each year, than you can from your best farm in Illinois. You can, after two years of the right sort of handling of these lands, quadruple the crops now being produced, because you can grow a recuperative crop and one or two money crops each year on the same land. The most of these lands are rented to negro tenants in small patches of 20 to 25 acres. Most of them use only small, one-horse plows and much of the farming is done just as it was a century ago. With the small plow that only scratches the top, it is impossible to turn anything into the soil, and while there is more need of humus in the soil in the South than in the North, on account of the longer growing season, more

sunshine and more rain, the system, or, if you please, lack of system, in the farming gives the average Southern farm no humus at all.

All Southern farming is not bad, but much of it is bad.

You can take the poorest of the run-down plantations and develop them as much in two years as you can your Illinois land in five years. This soil needs humus, and it is amazing how it will respond to even a moderate dose of decaying vegetable matter. You depend on red clover for building up your soil and keep one-fourth of your farm in clover. Down here we can plant, grow and harvest one money crop and have ample time for growing one of the several legume crops each year. Come down here and stay out in the country a few weeks while the crops are growing, and take note of the way the crops are grown, and you will wake up to the fact that crops could not be produced at all under a similar slack manner with you. Nature deals more kindly with the farmer here, and when he will join hands and do his part in a correct manner, the results are much more profitable than can be secured with you.

You can sow oats here in October, and when the ground is dry you can pasture them during the winter, and if care is exercised in the amount of stock allowed to run on them, the crop will be all the better for the pasturing. The crop will be as big as you can grow on your high-priced land, and the price will average 60 cents per bushel here. You can follow the oats with late corn, and can plant cow peas, soy beans or peanuts between the corn rows at the last cultivation. Either of these crops will improve the land as much as will your red clover, will give as much forage, and by allowing hogs to do the gathering you will keep all of the nitrogen in the soil and can make 500 pounds of pork per acre from the soy beans, from 500 to 1000 pounds from the peanuts, and 300 or more pounds from the cow peas. When the hogs have finished gathering the crop you can sow bur clover or crimson clover and have your land covered during the winter, preventing leaching and washing, and have winter or early spring pasture, and have a legume crop to turn under for the benefit of the crop that is to follow worth as much to the land as a two-year-old red clover sod would be. When the land is once seeded to bur clover it will last for many years if you will let it stand in the spring until it seeds or leave a six-inch strip between the rows until the seed ripens, when the strip can be turned under. The seed will not sprout until cool weather in the fall, and will again cover the ground, adding nitrogen and humus to your land. It is an easy matter to get your land so you can grow 100 bushels of corn to the acre and grow 20 bushels of cow peas worth an average of \$2.50 per bushel, or 30 bushels of soy beans worth \$1.50 per bushel, between the corn rows. Corn brings more in the South than it does with you, because less of it is grown than needed at home, and it is shipped here with the freight and several profits added to your price where it is grown. We have another legume crop that is grown during the winter—the hairy vetch. It is usually sown with winter oats and both of them made into hay just as the oats are in the dough, and you can easily count on three tons per acre of as fine feed as any farmer wants. The vetch has a higher feeding value than alfalfa, and with the oats unthreshed you have very valuable feed. The vetch will not reseed itself like bur clover. When you plow under a crop of bur clover it is

best to follow with corn, growing soy beans or cow peas between the corn rows. Until your land has as much humus as it needs, pick the peas or beans and plow under the vines. You can in this way get two money crops, either one worth more money than your average crops in Illinois. You will have one and some of the time two legume crops to turn under, and not only can build up the run-down land very fast, but you can so plan as to always keep the land well supplied with all the humus it needs, and the only fertilizer you will have to buy is phosphoric acid, which will not be a big expense.

If you will grow oats, followed by peanuts, you will get two money crops, and each of them good ones. You can get from 40 to 100 bushels of oats that will bring on the average 60 cents to 70 cents per bushel, and from 40 to 100 bushels of peanuts per acre with one and a half tons of peanut hay per acre, having 70 per cent. of the feeding value of wheat bran. The peanuts will sell for 90 cents to \$1 per bushel, and will be harvested in ample time to sow bur clover and keep the land covered during the winter, and a rich feed for the soil to turn under in the spring before planting corn. You will get from 75 cents to \$1 per bushel for your corn, and with from \$30 to \$50 per acre from the cow peas or soy beans, and a crop of vines to turn under, will give you two money crops again, and you could keep up this rotation indefinitely.

When you turn under the bur clover sod you have ideal conditions for Irish potatoes, and after they are marketed early in May you can follow with almost any crop you wish to grow. Suppose you grow sweet potatoes. You can get from 200 to 500 bushels per acre, and they will sell for 50 cents to \$1 per bushel.

The amount of net cash returns that an acre of land will give each year will eventually determine the selling value of that land. When conditions are as favorable as they are in the South, and one can not only build up run-down land, but keep his land built up and at the same time get a net cash return of from \$60 to \$125 per acre, which is very much more than you can hope for in your State, will you not agree with me that these lands will, after awhile, bring more than your lands in Illinois? You may know nothing about growing soy beans, cow peas, peanuts and sweet potatoes, but either of those crops are as easy to grow as corn, and the Government and the State Experiment Stations will give you bulletins that will tell you how to get the best results from either of the crops mentioned.

This country needs above everything else tens of thousands of your young farmers to come here and farm, as you do up there, with stock raising as the basis of your operations. You can grow hogs for much less here than with you, and you can have some sort of green pasture for them nearly the entire year. With rape, rye, oats, bur and crimson clover for winter forage; cow peas, soy beans and peanuts for summer forage, and sweet potatoes, chufas and Jerusalem artichokes for fall feeds, it only needs a little corn to harden the meat when finishing the hogs for market, and under these conditions pork can be produced for three cents per pound or less.

Cattle can be grown and fattened at less cost than with you, as the mild winters require less expense for buildings and for feed to maintain the animal. We have the best of all feeds in the cottonseed meal, and if the manure pile is cared for as it should be it will contain in fertilizing value 75 per cent. to 80 per cent. of the first cost of the meal.

While investigating you will have to go below the surface to realize that the things I am telling you are possible in a country that ships in a good part of its feed for man and beast! When you realize that it is a one crop country, and the only reason for not growing their own feed and everything they need for a living at home, is because they will not, and not that they cannot, you will see the great advantage the man has who comes and does his part toward supplying the great demand for feeds of all kinds.

The South is having a wonderful awakening along agricultural lines. The Government has spent millions to bring this about, and all of the Southern States have joined hands with Uncle Sam in the good work. This year fully one hundred thousand Southern farm boys have grown corn under the directions of Government and State experts, and many of them have grown from 100 to 225 bushels per acre. It has been proven beyond peradventure that the corn belt extends clear down to the Gulf of Mexico, and the lower part of the corn belt is the best part of it for the production of corn. The demonstrations made by the Boys' Corn Clubs is worth millions to the South, as it has opened the eyes of the ones who had gotten into a rut and were not following the right methods in handling the corn crop. You can find 100 progressive Southern farmers today where you could have found one five years ago. The results of this awakening will be, not only to make the returns of all farming operations more profitable, but will tend to increase the value of all Southern lands. Farm lands have about doubled during the past ten years, and they will increase faster than ever from now on, and when they are several times the present prices they will be the best investments to be made in the entire country, because Southern lands will some day command higher prices than similar lands up North. They must do so because they will net more cash returns each year.

Another great item in favor of farming in the South is that the farmer and his family will not only enjoy life more on account of the cooler summers and warmer winters, but as they live in the open more of the time they will have better health, pay out less for doctor bills, less for clothes, and as they can have a green garden the most of the year they will pay out less for their living than the Northern farmer.

You know all about growing oats, corn, hogs and cattle, and you can grow peanuts, soy beans and cow peas just as easy. They are each summer crops and will give good returns in the very driest weather.

There are other crops it will pay any one well to specialize on. One of these is making sugar cane syrup. That is a business that will never be overdone, as the folks up North have never had a taste of the real home-made syrup with nothing in but the cane juice and made in the right way, properly cooked, containing as it does all of the sugar, it is the best of all syrups. It is as near a certainty as anything in the agricultural world, and will give good returns for the labor expended, as you can make from 200 to 600 gallons from

an acre. It can be made ready for the market for 20 cents, and will sell for 50 cents to 80 cents per gallon.

I did not try to even touch on the possibilities of Southern agriculture, or explain the advantages of the dairyman and poultryman, who can get more for his output and produce it for less money than his Northern brother; neither did I touch on the opportunities in fruits or trucking. My wish was to emphasize the ease with which the many legume crops can be used for building up run-down lands and keeping up the fertility of the well-farmed lands here in the South.

### SOUTH'S MINERAL OUTPUT BY DECADES.

	VALUE.	
	The South.	United States.
1880.....	\$18,226,000	\$364,928,000
1890.....	\$60,218,000	\$606,476,000
1900.....	\$129,857,000	\$1,107,031,000
1910.....	\$369,678,000	\$2,003,745,000

	INCREASES.			
	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890...	\$41,992,000	230.4	\$241,548,000	66.2
1890-1900...	\$69,639,000	115.6	\$500,555,000	82.5
1900-1910...	\$239,821,000	184.7	\$896,714,000	81.

### LEADING PRODUCTS.

COAL.		
(Tons of 2000 pounds.)		
	The South.	United States.
1880.....	7,002,000	71,482,000
1890.....	24,925,000	157,771,000
1900.....	54,510,000	269,684,000
1910.....	120,856,000	501,577,000

	INCREASES.			
	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890.....	17,923,000	255.9	86,289,000	120.7
1890-1900.....	29,585,000	118.8	111,913,000	70.9
1900-1910.....	66,346,000	121.7	231,893,000	85.9

IRON ORE.		
(Tons of 2240 pounds.)		
	The South.	United States.
1880.....	703,000	7,100,000
1890.....	3,516,000	16,036,000
1900.....	4,749,000	27,553,000
1910.....	7,002,000	56,890,000

	INCREASES.			
	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890. ....	2,813,000	400.1	8,936,000	125.9
1890-1900. ....	1,233,000	35.1	11,517,000	71.8
1900-1910. ....	2,253,000	47.4	29,337,000	106.5

PETROLEUM.		
	(Barrels.)	
	The South.	United States.
1880.....	179,000	26,286,000
1890.....	499,000	45,824,000
1900.....	17,102,000	63,621,000
1910.....	79,994,000	209,556,000

	INCREASES.			
	The South.		United States.	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890.....	320,000	178.8	19,538,000	74.3
1890-1900.....	16,603,000	3327.2	17,797,000	34.4
1900-1910.....	62,892,000	367.8	145,935,000	229.4

PHOSPHATE.			
(Tons of 2240 pounds.)			
	Production.	Increases.	
		Amount.	Per ct.
1880.....	211,000	.....	....
1890.....	510,000	299,000	141.7
1900.....	1,491,000	981,000	192.2
1910.....	2,655,000	1,164,000	78.1



# Importance of the South in the Production and Consumption of Fertilizers



THREE essentials to plant growth are phosphorus, nitrogen and potash. They are fundamental elements in fertility of the soil, and when taken from the soil in the production of crops must be returned if the soil is still to be useful. Some crops add enriching elements to the soil, but many make constant drains upon it, and the effects of these drainings must be counteracted artificially by means of fertilizers.

The South not only has a natural monopoly in materials entering into the manufacture of commercial fertilizers, but its steadily-increasing importance in the production of many important crops is due to the fact that it leads the country in appreciation of the value of fertilizers as a reinforcement of nature. It is the center of the country's fertilizer manufacturing industry, and it uses more than two-thirds of the total amount of fertilizer made in the country.

In ten years between 1900 and 1910 the expenditures for fertilizers in the South increased from \$29,277,000 to \$75,391,000, or at the rate of 157 per cent., and while this process of more than doubling was in progress in the South there was an increase in such expenditures in the rest of the country of only 60 per cent., from \$24,353,000 to \$38,882,000. In 1900 Southern expenditures for fertilizers constituted but 55 per cent. of the total, but the proportion increased by 1910 to 66 per cent. of the total. Comparison of expenditures in 1900 and 1910 by States is made in the following table:

Expenditures for Fertilizers in the South.

States.	1900.	1910.	Inc. P. C.
Alabama .....	\$2,599,000	\$7,627,000	193
Arkansas .....	173,000	596,000	245
District of Columbia .....	23,000	16,000	*30
Florida .....	753,000	3,601,000	373
Georgia .....	5,739,000	16,819,000	193
Kentucky .....	908,000	1,348,000	48
Louisiana .....	1,077,000	2,001,000	86
Maryland .....	2,619,000	3,375,000	29
Mississippi .....	932,000	2,699,000	190
Missouri .....	371,000	662,000	78
North Carolina .....	4,479,000	12,245,000	173
Oklahoma .....		26,000	..
South Carolina .....	4,494,000	15,130,000	237
Tennessee .....	898,000	1,212,000	35
Texas .....	125,000	589,000	371
Virginia .....	3,682,000	6,925,000	88
West Virginia .....	405,000	520,000	28
Total .....	\$29,277,000	\$75,391,000	157
United States .....	\$53,630,000	\$114,273,000	113

\*Decrease.

The increases in quantity consumed in recent years in the South are indicated in the following table, showing by States quantities used in 1901, 1910 and 1912, representing nearly 93 per cent. of the total quantity consumed in the whole South in the last-named year:

Consumption of Fertilizer in Tons.

States.	1901.	1910.	1912.
Alabama .....	191,583	401,692	463,760
Arkansas .....	15,000	27,000	54,265
Florida .....	37,046	121,425	180,549
Georgia .....	457,153	1,015,104	1,069,982
Kentucky .....	40,000	45,000	35,000
Louisiana .....	47,883	87,900	83,985
Mississippi .....	66,173	131,526	108,900
North Carolina .....	285,578	619,915	693,645
South Carolina .....	293,000	721,500	778,142
Tennessee .....	40,018	55,900	70,610
Texas .....	10,500	34,300	47,500
Virginia .....	200,000	346,555	368,100
Total .....	1,683,964	3,607,817	3,954,468

It will be noted that the larger increases between 1901 and 1912 among the twelve Southern States included in the table were in Alabama, Florida, Georgia, North Carolina, South Carolina and Virginia. The total increase in the twelve States was from 1,683,964 tons to 3,954,468 tons, or at the rate of 135 per cent., whereas the increases in the six States mentioned were at the rate of 388 per cent. in Florida, from 37,046 tons to 180,549 tons; of 165 per cent. in South Carolina, from 293,000 tons to 778,142 tons; of 143 per cent. in North Carolina, from 285,578 tons to 693,645 tons; of 142 per cent. in Alabama, from 191,583 tons to 463,760 tons; of 134 per cent. in Georgia, from 457,153 tons to 1,069,982 tons, and of 84 per cent. in Virginia, from 200,000 tons to 368,100 tons.

These increases coincide with the expansion in the growing of early vegetables and fruits for Northern markets in four or five of these States, and with a tendency in three or four of them to regain in cotton growing something of the positions they held twenty-five or thirty years ago before the drift to virgin soil then requiring no fertilizers resulted in shifting of the center of cotton growing to the region west of the Mississippi River. Crop rotation, improved

methods of cultivation, the use of cowpeas and similar leguminous crops for soil enrichment have made much progress to the betterment of agricultural conditions in the South; they have, though, not prevented an increase in the use of commercial fertilizers, and that use must become even greater as the highest development of agriculture in the South is reached in the bringing into cultivation of millions of acres of land now idle and in getting the best returns from every acre cultivated.

There is no possibility that the South can fail to meet the demands upon it for fertilizer materials. The cotton plant, for instance, has one product—its seed—containing phosphorus, potash and nitrogen, the estimated fertilizing value of the ton of seed being something more than ten dollars. Between 4,000,000 and 5,000,000 tons of crushed cottonseed—about 70 per cent. of the Southern annual crop of seed—are crushed in the oil mills annually, and the hulls containing the potash and the cake and meal are used in stock feed, to be returned as manure to the soil, or in the manufacture of commercial fertilizers. The oil meets animal products in the manufacture of foodstuffs, and the by-products of the abattoir and packing-house—blood, bones and tankage—become ingredients of commercial fertilizers. There is thus a practically endless chain of cottonseed, cattle and fertilizers which has been realized in the establishment of packing-houses in the South, made commercially practicable and profitable by artificial refrigeration. The effect must be an expansion in stock feeding and a consequent maintenance of the fertility of Southern soil. Packing-house by-products and fish products containing nitrogen and potash are blended in the manufacture of fertilizer with cottonseed meal, with phosphoric acid made in the South and with potash and nitrates brought from abroad. Even in respect to the two latter ingredients, the South may become of vital importance. Cottonseed hulls already supply a certain amount of potash, and that element is also derived from the bitterns of West Virginia, and the fixation of nitrogen electrically from the air for the manufacture of nitrates has already begun in South Carolina.

For the supply of their phosphoric acid, fertilizer manufacturers depend upon phosphate rock, which, in its crude form, is not available for plant food. In spite of recent examinations of phosphate rock deposits lying within two or three Northwestern States, the South must for many years to come supply the great bulk of the phosphate rock used in this country, in addition to exporting great quantities. The South is now mining 3,400,000 tons of phosphate rock annually, an increase from 211,277 tons in 1880, and is exporting about 1,200,000 tons a year. Begun in South Carolina in 1867, the mining of phosphate rock has increased with great rapidity, the known phosphate deposits of the South being along the coast of South Carolina, in central and west Florida, in central Tennessee, and in parts of Arkansas, Alabama, Georgia, North Carolina and Mississippi. South Carolina companies controlled the phosphate market for twenty-one years, but Tennessee production entered the field in 1894, just as South Carolina yielded first place to Florida, where commercial mining had begun in 1888. Florida is now producing about four-fifths of the country's output. The census of 1909 found \$10,781,192 invested in the mining of phosphate rock, employing 8186 wage-earners. Upon that capital and that number of workers largely depended the fertilizer industry, with a capital in that year of \$121,537,000, employing 18,310 wage-earners, and producing to the value of \$103,960,000. It is estimated that between \$150,000,000 and \$175,000,000 now represents the capitalization of the fertilizer industry which is dependent upon Southern phosphate rock.

Until six or seven years ago the country was forced to depend for its supply of sulphuric acid upon imports or native pyrites. But after quite a while of desultory endeavor and experiment in connection with the vast supplies of almost chemically pure sulphur in Southwest Louisiana, Herman Frasch made it possible for the South to supply all the material necessary for the derivation of sulphuric acid, although this is not yet done. If there had been any doubts on that point, the recent exploitation of sulphur deposits in the Brazos region of Texas would have removed them.

Recognition of the wisdom of expenditures for fertilizers which the South has shown in more than doubling the quantity used in the past ten years is manifest in an increase of such expenditures in the six New England States between 1900 and 1910 from \$4,298,000 to \$9,313,000, or by \$5,015,000, equal to 116.6 per cent. Again, the increases in California in the same period from \$937,000 to \$2,132,000, or by \$1,195,000, equal to 126 per cent.; in New Jersey, from \$2,165,000 to \$4,206,000, or by 94 per cent.; in Michigan, from \$492,000 to \$936,000, or by \$444,000, equal to 90 per cent., and in Ohio, from \$2,695,000 to \$4,163,000, or by \$1,468,000, equal to 54 per cent., show that farmers in all parts of the country are alive to the importance of supplementing nature with the use of commercial fertilizers as a means of getting the best returns from their lands.

The South, with all of its remarkable progress, has still vast agricultural potentialities, and it is finding greater profit in using fertilizers. Excepting the matter of mechanical handling of ingredients, one merely of capital of mind, muscle and money, the South has no problem as to obtaining a sufficient supply of fertilizer for its own needs as well as for the needs of the rest of the country. It is only a question of more thorough cultivation for the South to double and even treble its annual output of cottonseed. It will be many years before the known deposits of phosphate rock are exhausted, even if no other deposits be discovered in the meantime. Nitrates may be expected to be derived from the atmosphere with an increase in hydro-electric development, potash in larger quantities may be reasonably expected and the supply of sulphur may be regarded as practically exhaustless.

# Uncle Sam's Views of the South

## Admitting His Mistakes in the Past, He Now Proclaims the South the Nation's Greatest Asset

### AN INTERVIEW IN WHICH HE TELLS OF ITS PAST, PRESENT AND FUTURE

**"B**Y GUM!" said Uncle Sam, as he looked up from a study of the statistics of the South's progress to greet the MANUFACTURERS RECORD.

"I believe you are right in claiming that the South is the nation's greatest asset. I have been doing a good deal of thinking of late. I tried to digest the statistics of the South's upbuilding, and for a while thought they had given me a bad case of colic, but pretty soon I found it was a bad case of conscience at work. You know a good many people's consciences are located in their stomachs, and you can't always tell whether it is genuine repentance for sins or a bad liver that sends a man to the mourner's bench. As I thought of how long I almost ignored the South, and at times made laws which enriched other sections, often at the expense of the South, I got ashamed of myself. And yet, despite my shortcomings the South has grown rich and powerful. Thinking over these things caused my conscience to stir itself and it soon gave me a pretty hard jolt. It proved to be a genuine conscience work and not indigestion. I am glad to see you. The fact is, I want to talk to you about the South. I have repented of my mistakes, and now I want to do what I can through the MANUFACTURERS RECORD to proclaim to the world the real truth about the South. I know that for a good many years many of my people in the North and West had a very unfavorable opinion about your section. Maybe I got a little twisted myself as the result of the trouble I had between 1861 and 1865 in persuading your Southern people not to set up an independent government for themselves."

"Now, Uncle Sam," said the MANUFACTURERS RECORD, "the South has no ill feeling because of the family squabble of former days. We thought we were right. The other folks thought they were right, and as they outnumbered us, naturally you were controlled by the majority. There is no hatred, so it is said, so bitter as that of near relations when they get into a squabble, but with us hatred long ago gave way to renewal of family ties and of kindred love. It's all one country now. The MANUFACTURERS RECORD regards as its highest praise that which says that through its work for Southern upbuilding it has helped to break down sectional barriers, has brought the South, the North and the West into closer business and thus into closer personal acquaintanceship, and broadened and deepened the nation's life. But if you want to talk out in meeting, go ahead. It may do great good to tell the people of the whole world just why the South was halted in material upbuilding and why its advancement is now to be the dominant factor in the nation's business life. You know that the war and reconstruction days held the South back for 40 years while the balance of the country was making amazing progress, but lots of people don't understand this, and so if you will tell the story as you see it, you will do the whole country, as well as the South, good."

#### The South's Influence in Making This Country

"Well," said Uncle Sam, as he shifted one leg over the other, "I have been studying the South lately. I have been thinking a good deal about the history of this country and the relation of the South to it, and, do you know, the more I study the matter the deeper the impression gets that the South is the greatest section on earth, and that its people, even if they do not always make as much fuss about it as some others, accomplish more, all things considered, than any other people that ever lived in this country or anywhere else."

"Between 1861 and 1865 I learned by experience that the old ideas which prevailed for many years in the North and West that the South was wholly an agricultural country, and that its people

were rather given to inactivity in business, or as some of their enemies said, to laziness, were wholly untrue.

"At that time I learned to pray that if the soldiers from the South were samples of inactive or lazy people, would Providence keep us from running against any very active and hustling fellows, for I didn't want to meet any set of men who could march farther and faster, and fight harder than the men from the South."

"I ought to have been proud to claim as my folks, people who had such moral and physical stamina that they were willing to sacrifice every dollar they had and life itself for a principle—not for slavery, as some people thought, but for the principle of self-government as they understood it. It should be remembered that not one-fifth of the white people in the South were slave owners in 1860. The men who could march all night and fight all day, or march all day and fight all night, though ragged and foot-sore and with only a crumb of bread for a meal, because they believed they were fighting for their country's honor, evidently had in them the kind of stuff which, when turned to material development, could be equally as energetic and equally as successful in putting up a good fight. When I think over these things I wonder how in the world it ever got into my head that with any kind of a fair chance the people of the South would not at least equal the people of any other section of the United States in material activity."

"There are some things to the South's credit that ought to be told and retold for the country's good."

"Everybody knows that it was due to Southern men that we added about three-fourths of the territory which now forms continental United States."

"Those old Southern fellows were the best bargain hunters in the world when it came to making a land deal. They bought the Louisiana Purchase and likewise Florida for a few cents an acre. No real estate speculator of today can quite equal those old Southern leaders in their real estate bargains for the Government. They did things on a big scale. When they bought real estate like the Louisiana Purchase and Florida they bought it by the wholesale at rock-bottom prices. This country is many billions of dollars richer because of their work. If they had not had the vision to see the business profit in making such wholesale land purchases and the energy to put the deals through, this country never could have amounted to much."

"Did you ever stop to think of the limited area we originally had and how circumscribed we would have been without the land deals made through Southern men for national expansion? Through them Anglo-Saxon domination of this continent was made possible. Pretty nearly all that the United States is in extent of continental territory, in achievements made and in material resources, is due to the old fellows of the South who proved their abilities in business as well as in statesmanship and in war."

#### Despite Heavy Handicaps in the Past, the South Led the Nation

"Before the war the South beat the East in making money. In 1860 it had nearly one-half of the total wealth of the country, or, to be exact, 41.9 per cent., and was getting rich faster than the New England and Middle States combined. Why, between 1850 and 1860 the increase of the wealth of these sections was less by over one billion dollars than the South's gain. For several years after 1865 this Government, controlled by the prejudices and passions born of the war, did all in its power to impoverish the South by visiting upon its people misgovernment and corruption in political life. Every sensible man now sees our mistake. I am very penitent now as I think over how I helped the enemies of the South to bring about even greater wreck and ruin than had been left by



the war itself. This forced development to other sections. The rest of the country had the backing of all the strong financial interests of the world, as well as of this Government. I gave away hundreds of millions of acres of land to subsidize the building of railroads through the West. I filled Europe with stories about the resources of the West, and bade all the people of the world to come and get their share of the things I was giving away. I encouraged the financial houses of Europe and America to bend their energies and their capital to the development of the West. Some of our tariff laws gave Eastern States advantages for manufacturing over the South. This was done by fixing it so as to put many of the things the South produced—"raw materials," so-called—on the free list, while leaving a high rate on what the South had to buy.

"For a time I treated the South worse than a red-headed step-child, but it kept on growing; it got rich fast, notwithstanding the way money was drained from it in order to pay pensions, to pay insurance and to do other things that advanced the prosperity of other sections at its expense. This drain has aggregated some billions of dollars since the war. Fortunately, the South is beginning to develop its own insurance, its own banking and other things which will add enormously to its wealth.

"I let the cotton buyers do all in their power to beat down the price of its cotton for the benefit of the spinners of Europe. Then every time the 'bulls' came along and tried to put the price up a little, the land was flooded with stories from Washington about how cotton growing in other parts of the world would soon destroy the cotton interests of the South unless prices were kept so low that foreign spinners would not be tempted to try to raise cotton in Africa, where I knew they never could raise it to advantage, though it was a pretty good bluff for the foreigners to play against the people of the South.

"If the South had not had more natural advantages than any other country on earth, and if its people had not demonstrated that in business they had the same energy and ability which enabled them, between 1861 and 1865, to live on almost nothing, to march night and day and fight as few people in the world ever fought, that country would have gone to the dogs long ago. For years all the power of the National Government and all the capital of the world interested in this country were united to develop the West and the Pacific coast to the exclusion of the South from such activities. When the Germans and Scandinavians began to emigrate so largely to this country, I knew they were the best people in the world to put into the South, and I knew the South was the best place for them, but few hands were raised in defense of that section, while the railroads and the immigration agents of the West flooded Northern Europe with maps of this country on which the South was printed in black to indicate that it was a land of negroes, or else in yellow, with a story that it was full of yellow fever. Many of my consuls in Europe knew that every hamlet in Northern Europe was full of literature of this kind, but about that time I was joined to the enemies of the South and made little or no effort to develop a section which I now know to be not only the greatest asset of this nation, but the best and most richly endowed material asset of the world."

"Uncle Sam," said the MANUFACTURERS RECORD, "we are glad to see you make this confession, for 'an honest confession is good for the soul,' and in this case it will be good for the South and the nation. You were a good deal of a sinner against the South. We know your repentance is genuine, that you have had a real change of heart and that you, like the rest of the people of this country, are beginning to understand the South and thus to appreciate its people and its advantages. We do not mind telling you, however, that you do not know it yet. You are just getting a little glimpse of it. It is 10 times as great a country as you think it is, even with all your change of heart. It is going to be 10 times as rich a country as you have ever imagined. It is really an undiscovered country, so great are the resources not yet even brought to life. You think of the United States as a pretty big country, and think that its wealth of \$140,000,000,000 is a very handy balance to the credit of its 136 years or so of operation as a business enterprise. But this country has only commenced to do business with the world, only begun to accumulate money, only started its material development as compared with what the next quarter of a century will show, and the South is going to lead in this growth."

### From Bankruptcy to Vast Wealth

"All you assert," said Uncle Sam, "as to the way I ignored the South is true, and I am sure that what you say about the wealth and power which that section is going to develop is true. When I think of the busted, bankrupt condition of the South after the war, and know how reconstruction days were a great deal worse than war, even though war days were, as one of my generals said, 'Hell let loose on earth,' I wonder that your section was ever able to get on its feet financially. But while thinking over that, I have been studying the statistics of what has been done. You have about 33,000,000 people in the South, but they are doing so much more than the 50,000,000 people which our country had in 1880 that I am getting a little ashamed of the others. Do you know, I think if the North and West and the Pacific coast, in proportion to their population and the Government backing which they had, had accomplished as much as the people of the South have done, this country would have twice as much wealth as it has.

"After the war you started with nothing. In fact, your debts were so big that if the whole South had been sold out at auction it would not have brought enough to pay its public and private indebtedness. For 40 years you were simply trying to catch up on debts, while we started up here after the war so rich that we hardly knew how to spend the money and kept piling it up year after year. And now you have more money in your factories than the whole country had in 1880, though you have 16,000,000 or 17,000,000 people less. That is going some.

"And as to agriculture, you set the pace for the world. Talk about agriculture in the West and on the Pacific coast, and then look at what the South has been doing and any Western or Pacific coast man ought to feel ashamed of himself. Why, you are producing a greater agricultural output, including animal products, by \$840,000,000 than the total value of all the farm crops, not including animal products, in the United States as late as 1890. And some of us once had an idea that you were a little slow and non-progressive, and that your soil was not very good, and that you could not raise anything but cotton. Jehoshaphat! If you are slow, or if your soil is poor, what in the world would have been left for the rest of the country if you had been energetic and your soil had been good?"

### Anglo-Saxon Love of Achievement

"That is all true," said the MANUFACTURERS RECORD, "but we are not bragging so much on what we have done as on what we are going to do. We are just getting ready to work.

"Way back in 1860 we had 950,000 of our people living in the West and in other sections beyond the borders of the South, developing the country. They were Anglo-Saxons, and hence they were pioneers who loved to take hold of new and big propositions. Swank, in his 'History of Iron in All Ages,' said that the pioneers in the mountain regions of the South 'seemed to have been born with a genius for iron-making.' As a matter of fact, the pioneers in the whole South were born with a genius for doing things. They loved to achieve, whether in statesmanship, in war, in engineering or in agriculture. Some of the fellows who went West did not like slavery, so they journeyed across the mountains and opened up the Western prairie regions to get far away from it, or they led the 1849 movement to California and laid the foundation of the wealth of that State. You know that with a very large number of people in the South slavery was never popular; many of its foremost men and women regarded it as uneconomic, as well as morally wrong, and it never would have been fastened around the neck of the South if that section in early days had been left alone to solve this question. Many of the ablest men of the South, including some of its greatest military leaders in the Civil War, were opposed to slavery.

### The South Has Given More of Energy to Other Sections Than It Has Received in Return

"The heaviest loss to the South was not the destruction of property by the war nor the cost of maintaining its armies for four years, but the loss of men through death in battle and through emigration after the war. Because the South was almost destroyed by war, and by reconstruction days which continued till 1876, the opportunities for work were so limited that between 1865 and 1900 over 2,500,000 Southern-born whites went entirely

beyond the borders of this section; and so far as the Central South is concerned, another million left and went out into the Southwest, mainly to Texas, Missouri and Arkansas. The Central South from Virginia to the Mississippi River thus had to stand the drain by emigration of 3,500,000 of its white people. This is the greatest drain upon the vital life of a country that has been seen in modern times. We sometimes hear that the development of the South has been due to the energy and capital of people from other sections, while but little attention has been given to the fact that the South has freely given to other regions many times as much as it has received in numbers and energy. Of immigration from other sections it has had comparatively little until recently, while emigration drained much of its life blood to the enrichment of the North and the West and the Pacific coast. With this lessened vitality the people who were left at home had to meet many problems greater than Anglo-Saxon civilization had ever before faced; problems of reorganizing State governments, of the reconstruction of their labor system, of their agricultural and business interests, as well as problems of law and education. To the men who 'staid by the stuff' and who bore these burdens, increased many fold as they were by emigration of so many of the strongest and ablest men of the South, eternal credit should be given."

#### The Truth of History Needed to Be Known by All

"That's all true," said Uncle Sam. "I might resent your rubbing these things in so hard now, were it not that the truth of history justifies your statements, and because the South and its people, past, present and future, cannot be understood without a knowledge of these facts, and because it is vital for the country's good that each section should understand the other. Maybe we could have avoided the war if all sections had known each other in the early days.

"The Northern or Western man who does not know the true story of the South will not be able to forecast its development, and thus cannot measure in advance its influence on this country and on world affairs. Its resources must be known, the reasons for the delay in their big development must be understood and the inherited trait of Southern men in engineering work, in manufactures and in managerial ability must be realized or else the important part the South is to play in world affairs will not be grasped. You know, when I wanted to build the Panama Canal, I got most of the engineers from the South. Chicago's great drainage canal, one of the biggest pieces of engineering work in the country, came from the brain of a Virginian. Baltimore's \$20,000,000 sewerage system, accounted by many as the most advanced sewerage work in the world, has been engineered by a Southern man. It was left for a Southern man to finance and engineer to success the tunnel under the Hudson River, the greatest finished engineering achievement of the day, after English and American engineers and great promoters had repeatedly failed. My weather bureau and all my hydrographic work harks back to Maury, the Virginian upon whom Europe heaped more honors for scientific attainments than it ever gave to any other American. The list of men from the South who have wrought marvelous achievements in things that make for human progress can hardly be counted. The McCormick reaper, which revolutionized the world's agriculture, was the invention of a Virginian. Without it the prairies of the West could not have been turned into wheat fields to supply Europe and America with foodstuffs. From the days of Washington all the way down, Southern men have had a genius for engineering and for big, broad business operations. And, by the way, speaking of Washington, what a genius he had, not only for pioneering engineering work, but for knowing how to pick out good lands. If he had lived in these days he would have been a billionaire, for he could see a bargain about as far ahead as any of the big fellows of this generation.

"A quarter of a century or more ago, when you took as your motto, 'The development of the South means the enrichment of the nation,' you did not have many believers. Faith in the truth of the motto was rather weak because there was lack of knowledge. Moreover, many people North and South did not understand that only through the development of the South could there come a well-rounded national life. Hence, they were slow in grasping the meaning of your motto. Millions of people in the

South, and in the North and West as well, would today be richer than they are if their knowledge of the South's resources and its future had been full enough to give them the faith which the MANUFACTURERS RECORD has always had.

"Had the South itself realized the truth of what you were preaching, it would not have given away so many millions of acres of its timber lands and its coal lands, its oil and its gas lands, for a few dollars an acre. There are a lot of millionaires in this country who are millionaires simply because they believed what you were preaching, and they staked every dollar they owned or could borrow to buy Southern properties at prices that were absurdly low.

#### Limitless Southern Opportunities

"These things remind me of a story told about that big sulphur deposit in Louisiana, the development of which raised such a hubbub in Italy. Italy had for generations controlled the sulphur trade of the world, but it doesn't now. Years ago someone discovered sulphur in Louisiana, but it was so far underground and so heavily covered with quicksand that every effort made to mine it proved unavailing. Finally a lot of rich New Yorkers after various experiments concluded, like others had done, to abandon the enterprise. A meeting was called for the purpose of disbanding and pocketing the loss, but the story goes that Abram S. Hewitt suggested that they make one more attempt and lend the company enough money to test a new system proposed by a man named Frasch. His plan was to pump superheated water into the mine under such pressure as to melt the sulphur, which would flow to nearby wells and be pumped out in its liquid state. Hewitt's proposition was accepted, Frasch's plan tested, and it is whispered around Wall Street that the annual dividends are 10 or 12 times as great as the capital invested. The property had been kicked around for years without buyers and was offered to a New Orleans man for \$15,000. He didn't think it worth it. It is taxed now at \$10,000,000. That sulphur success startled the Italian Government and upset the world's sulphur trade. It came near bankrupting all the Sicilian sulphur interests. Through this mine in Louisiana, the South dominates the sulphur trade of Europe and America, producing more than one-half the sulphur of the world. Another sulphur deposit is being developed in Texas, which experts claim to be similar to the one in Louisiana. The owners expect to make as much money as the crowd who own the Louisiana sulphur deposits have gathered in.

"A thousand illustrations come to me about similar wealth-making doings down South. A quarter of a century ago, so the railroad people tell me, the Southern Pacific Railroad officials did not believe that the prairie land in what is now the Crowley rice-growing section, through which their road passed on the way to Texas, would ever be worth anything. You could buy all you wanted at 25 cents an acre, and the seller would feel that he was cheating you when he took the money. But along came two men, one from Iowa and one from Louisiana, who insisted that the land could be drained and made to produce rice and other crops. The Iowa man had begged a pass to get down to Louisiana, and then he worried the Southern Pacific officials so much about the possibilities of the country and how he could bring settlers from the West that one of them, so I am told, in order to be rid of his persistence, said to him in substance one day: 'I will give you \$50 a month to keep out of this office. You can do what you please with it; but the country you are talking about is not fit to put a settler in. I won't be guilty of being a party to it.' That land is now selling at \$100 an acre, and about \$200,000,000 of wealth has been created by the rice industry and the thriving towns which have grown up there as a result. The railroad whose official had no faith in the country hauls out thousands of carloads of rice annually. Arkansas people have been doing equally as well in rice growing, which has changed a whole section of that State.

"And when you talk about making fortunes by draining the rice-growing lands of Louisiana and Texas, and irrigating the upland rice lands of Arkansas, think of the millions of acres of the richest lands in the world—lands which by comparison make the lands of the Valley of the Nile seem too poor to cultivate—that can be reclaimed down South. Already several hundred thousand acres are being drained by men who had the sense to scent this money-making chance. It beats gold mining even in a real gold mine. For \$50 an acre you can buy and drain big tracts



which will make an annual profit of over \$50 an acre. Do you know anything better than that? And out in Texas big English and American companies are spending millions in vast irrigation projects.

"You cannot turn around down South, so people from other sections who have been spying out the land tell me, without butting your head against facts showing what has been done in great development schemes and without finding still greater possibilities for doing equally as big things.

"Did you ever hunt birds when the coveys were so big and numerous that you never knew just where to shoot to get the best results?" asked Uncle Sam. "Sometimes," said he, "you get bewildered as the birds fly up in all directions, and you are liable to shoot in the air because there are so many birds you hardly know which way to aim. Well, that's the way down South. I have had my agents all over the South, experts from the Agricultural Department, experts from the Geological Survey and others hunting over that region pretty actively during the last few years, and I have learned that opportunities for investment, for development enterprises, for home making, for every imaginable kind of farming, for railroad building, for city activities, are so many and so great that the investor is very much like the hunter who becomes puzzled as to the particular bird at which to shoot. The investor who goes down South and studies these things hardly knows whether to put his money into a railroad, into a coal mine, into timber land, into sulphur deposits, into phosphate mining, into fertilizer manufacturing, into cottonseed oil, into textile mills, into citrus fruit growing or apple raising; or into peaches, pears or grapes, or dairying, grain growing, or into cotton growing. In all these lines and others he can find examples which show money-making possibilities that are not equalled anywhere else in the country over which my flag floats.

#### Fruit Growing Potentialities Compared With the West

"I know that the people on the Pacific coast are always hurrahing about fruit growing in California, and apple raising in Oregon and Washington; but the South can beat them both 'to a frazzle,' whether it be in apples or in oranges; and when it comes to grapefruit California, of course, simply draws out of the race, for Florida is the one supreme grapefruit-growing section known to the world; and as to peaches and grapes and figs, pecans, peanuts and other things, the South is the real home of these things. It is, indeed, the Garden of Eden for fruits and nuts. Why one county in Virginia raises 1,000,000 barrels of apples a year, while Florida is raising 7,000,000 or 8,000,000 boxes of citrus fruit. Last year's apple crop in four contiguous counties of Virginia and West Virginia exceeded the whole apple yield of Oregon and Washington in 1910. If the rest of the world knew what a fruit land it is, more than one flaming sword would be needed even to keep in line the crowd rushing Southward."

#### Southern Energy and Initiative Turned to Marvellous Account

"Uncle Sam," said the MANUFACTURERS RECORD, "you felt pretty proud of your country in 1880, when you had 50,000,000 people, and thought you were the biggest thing on earth, and the world seemed to take you at your own valuation. Have you stopped to think of how much greater in achievements is the South today with 33,000,000 people than was the United States in 1880 with 50,000,000?"

"Yes," said Uncle Sam, "I told you a little about that in the beginning. When I think over these facts I am impressed with three things:

"First, the natural advantages of the South must be greater than those of any other section of the world, or else such results would never have been possible, considering the poverty which prevailed throughout the South after 1865; and,

"Second, Southern people, and by this I, of course, mean the white folks, for they have done all of the planning and managerial work and a large part even of the manual labor, must be as brilliant in business operations as they always have been in war, and they must have energy and stick-to-it-tiveness such as they displayed in every emergency and on every battlefield during the war.

"Third, that despite the bad teaching by politicians and misguided philanthropists of the negroes, which ruined many and

came near utterly destroying, morally, physically and financially, the whole race, hundreds of thousands of them have become good citizens and property owners and are earnestly striving to redeem their race from the ruin of false teaching. And these facts all prove that they have been well treated and protected by the white people of the South. No such marvelous progress could ever have been made in a lawless country or one in which a large part of its laboring population was mistreated.

"The Southern folks in war days found more ways to get over their lack of money and equipment, more ways to overcome seemingly impossible difficulties, more ways of acquiring the highest order of engineering skill, of soldierly ability; more ways to live without eating and to fight without weapons, than any other people I ever knew. The men who came out of the war with enough strength to enable them to run the plough, to build a railroad or open a mine, to teach school or to solve engineering problems, and their children and grandchildren, have for the last 30 years been turning into material development, into the building of cities, the improvement of agriculture, the construction of railroads, the broadening of educational and religious work, the same wonderful ability which they displayed on the battlefield or in devising ways to meet the needs of a starving army that must live without food and yet keep on fighting.

"When I remember that the South has \$700,000,000 more money invested in manufacturing than the United States had in 1880; that the individual deposits in its national banks exceed by nearly \$200,000,000 the individual deposits in all the national banks of the United States in 1880, and that individual deposits in all financial institutions in the South now exceed by \$130,000,000 similar deposits for the entire country in 1880, I become a little dazed; and yet, I find some figures even more astonishing than these. I know the South is only beginning to develop its agricultural interests; I know that the better methods in cultivation which are now being so vigorously pushed, and the vast increase in its fruit and trucking interests, will enable this section to double its agricultural output, even without increasing by a single acre the land under cultivation, and I cannot help but wonder what is to be its future, when even now its agricultural products, including animal products, exceed by more than \$840,000,000 the total value of all farm crops, not including animal products, raised in the United States as late as 1890, when our country had a population of 63,000,000.

"In the old days before the war, Southern agriculture probably produced larger wealth in proportion to the number of people employed than any other farming operations in the world's history. This was due in part to the South's remarkable natural advantages for agriculture, and in part to the well-rounded, diversified farming which came about by reason of the high degree of education of Southern planters. These men were among the most highly educated people in the country. Their broad business experience and their high education enabled them to direct to the best advantage the work of the slaves under their control. The man of inferior brain, therefore, did not have to depend upon himself, but was guided as to what to plant and how to cultivate it by superior knowledge and skill. The results were very marvellous. Between 1850 and 1860, the wealth of the South increased by more than \$1,000,000,000 in excess of the increase in the New England and Middle States combined. This was largely due to the splendid system of agriculture. After the war, the negroes and the poorer whites, without the knowledge of how to farm to the best advantage and unwilling to receive instruction from those whose superior knowledge ought to have made them guides and counsellors, came pretty near ruining the farming interests of the South by wasteful methods of cultivating the land and destroying its fertility. My good old friend, Edward Atkinson, once said that he believed this waste of soil offset all of the advance that the South had made in industry and railroad building up to 10 or 15 years ago. Within the last decade, however, there has been a wonderful change. Farming is showing more scientific work. Landowners are giving more attention to directing their tenants how to farm in order to get the best results and how to restore fertility to the soil. Small farmers are making much progress. Capitalists and corporations, some controlled in England and some in this country, have bought great tracts of land, which they are farming under scientific management and

producing results commensurate with what the best planters of the old South achieved. Thus the South, though it is only getting its agricultural interests in fairly good working shape for better and broader operations in the future, is already turning out \$3,300,000,000 in products a year, against \$2,460,000,000, the value of all the farm crops, not including animal products, in the United States in 1890. That's going some! Let the South keep on in its present progress of improved agricultural work and it can raise \$6,000,000,000 worth of stuff on the land now under cultivation. But the South has as much land available for farming which has never yet been touched by a plough as it has under cultivation. That tells the story of what it can do.

"Do you know that the value of farm lands, including buildings, in the South increased between 1900 and 1910 from \$1,088,000,000 to \$8,971,000,000, or a gain of nearly \$5,000,000,000 in one decade? This is nearly five times as great as the total national banking capital of the United States. Five billion dollars is so big a sum that not many people can take in its meaning; but when I tell you the national banking capital of the entire country is just a little over \$1,000,000,000, you can get an idea of what this actual increase in the value of Southern farms within ten years signifies.

"That country of yours seems to be making good your predictions with a vengeance. In 1912 it mined 132,000,000 tons of coal, which is 62,000,000 tons more than the whole country mined, both of bituminous and anthracite, in 1880. From its oil wells there were pumped last year 85,000,000 barrels of petroleum. Even as late as 1890, the best our whole country could do was 63,000,000 barrels. And as to natural gas, the South has the greatest supply known to the world.

"You are actually spending \$12,000,000 more a year on the support of public education than the United States thus expended in 1880, though in that year our people put out over \$78,000,000 for public schools.

### The Best Kind of Immigration Direct From Heaven

"It is true that your population has not been growing quite as rapidly as that of the country at large, and for this there are a number of very good reasons. Moreover, you sent away to other sections 2,500,000 people looking for work, because after 1865 they could find none at home. You have been getting almost none of the immigration that has been pouring into this country at the rate of nearly 1,000,000 a year for some years. And maybe, considering the character of very much of the immigration that is coming to us now, you are to be congratulated, especially as your increase of native population is very much larger than the native increase in the rest of the country. That is to your credit very much more than if you had simply increased your population as we have done in the North and West by dumping in millions of foreigners, a large proportion of whom may be counted as undesirable, helping to bring about a lessening of the birth rate among Americans in these sections, which is only the working out of what Gen. Francis A. Walker, superintendent of the census of 1880, a quarter of a century ago claimed to be an economic law. Big families are still popular down South, and nobody needs to preach against race suicide down there. You are in this way getting the best possible population. As the increasing industrial and agricultural prosperity enlarges the demand for labor and causes an advance in wages, as the opportunities for fruit and truck growing become better understood, you will, of course, see a steady movement of people, American and foreign born, Southward. The working out of economic laws will bring this about, and already there is seen a great Southward trend of population. The people who are now coming are but the advance guards of a mighty army. When you look at the rate of increase in population and compare this with the rate of increase in business interests, you get a pretty good idea of how things have been humming down South. Between 1880 and 1912 your population increased 79.5 per cent., but your capital invested in manufactures increased 960 per cent., your national bank resources 988 per cent., your individual deposits in national banks 1350 per cent., your common school expenditures 650 per cent., your farm lands and buildings 305 per cent., and the value of your farm products 312 per cent. No wonder your farmers and your city people are building better homes. No wonder agriculture is making great advance and

churches and schools are being erected all over the land. In the activity which I see everywhere in the South in the building of schools and churches I find a splendid proof that, though wealth is increasing, men are not decaying."

### Uncle Sam's Views of the Future, and His Reasons Therefor

"All you have told us, Uncle Sam, about what the South has been doing is true," said the MANUFACTURERS RECORD; "and yet, it is not so much about what the South has done as about what it is to do in the future that the world is interested. We are living in a very commercial age in which men want to know not so much about the past or the present as about what the future is going to bring forth. The investor wants to know where to put his money to the best advantage. The banker is anxious to know whether conditions are such as to guarantee continued growth of the cities in which he is investing his own or his clients' money. Railroad owners and operators are often-times puzzled in forecasting the country's development, and therefore do not know what preparations to make for it. It is to the future that the long-headed man must look, and so while the bankers and investors generally, and railroad operators and manufacturers and farmers are all interested in what the South has done during the last 30 years, they want to know what you think about the future.

"Is this growth going to continue?"

"Is it going to continue?" echoed Uncle Sam with emphasis. "Well, I am afraid to tell you what I think about it; you might call me a boomer, or a wild optimist, or a dreamer. I am a little particular about my reputation for conservatism, but I don't mind saying that in my opinion this growth is going to be far more rapid than it has been in the last 30 years, and that the South will make more progress in the next 10 years than it has made in the last quarter of a century. Just look at it a minute.

"That section has come up out of desperate poverty.

"It had more problems to solve than any other people on earth ever met.

"It faced dangers of every kind at home and away from home.

"It lost hundreds of thousands of its best men in battle and through emigration; yes, when we count emigration, it lost some millions of its best people.

"With its vitality thus weakened, it had to meet and overcome difficulties which ordinarily would have taxed the virility of the strongest people in the world. To look for rapid improvement was like expecting a typhoid patient just beginning to get out of the fever to run a race, or enter a prize fight.

"But weak as it was, the South ran the race and out-distanced its competitors. It entered the prize ring and, though it got a lot of hard blows and was occasionally knocked up against the ropes, it was always able to come back. And it grew stronger every minute instead of getting weaker.

"It has demonstrated its ability, even under these conditions, to do what no other people ever did.

"Now it has accumulated a lot of money, a lot of experience and a self-confidence born of its achievements and its knowledge of its resources.

"It does not need to ask favors of anyone.

"It does not have to beg for capital to come and develop its industries.

"It does not have to hunt elsewhere for technical skill for agricultural or industrial affairs.

"I know your people are glad to get outside capital and outside men to come down and take active part in the work, for there is room enough in the South for three or four times as many people as you have and for all the spare capital of the country to find the most profitable field in the world for employment. But there is a great difference between having to beg outside capital, as you did for so many years, and your present position of being able to say:

"We will welcome and protect your capital; we will offer it the best opportunities known to mankind, but we don't have to beg you as we once did; hundreds of millions are coming and yours can come too, but it is up to you to decide."

"You know your section could easily support 100,000,000 people, provide ample employment for them, furnish the foodstuffs to nourish the body and the wool and the cotton to clothe them, and still not half tax your resources.



"You could do more manufacturing than the United States is now doing, and develop a foreign commerce far greater than that of which we are now boasting so much; and even then you would not have commenced to measure the limit of your potentialities.

"If you would take a yardstick as the measure of the coal resources of the South and then want to compare Great Britain's coal with yours, you would have to scratch a little four-inch end of the yardstick to represent Great Britain's comparative coal area, though the wealth and power of that country has largely come through the dynamic influence of its coal. The whole of Europe, with its 400,000,000 people, would only show about 18 inches on the yardstick measure of coal, as compared with yours; for all Europe has only 44,000 square miles and the South has 88,000 square miles.

"Experts tell me that three-fourths of the coking coal in the United States is in the South. The Connellsville region of Pennsylvania, which for more than a generation has been the center of coke production in America, and upon which Pittsburgh and the Lake regions have mainly depended for coke, it is now said by experts, will be exhausted within less than 30 years. In the life of a nation, or of a great industry such as iron and steel, 30 years is a very brief period. The bare realization of the fact that that district has only 30 years of life, has compelled farseeing metallurgists and long-headed investors to go into the Southern coking coal field in a big way. Railroad and financial interests are watching the coal regions of the South and striving to get strategic locations in them with as much energy as the leader of an army watches to rush his men into some strategic position in order to hold the control of the vantage points in the region where great battles are to be fought.

"You are beginning to utilize your water powers and are stretching a network of wires from one end of the land to the other to make available the millions of horse-power that have been wasted, as these rivers, since the dawn of creation, have run their courses idly to the sea.

#### **Cotton, the Most Royal Crop of Earth, Dominates Our Finances and Commerce**

"With practically unlimited resources in fuel and water for power development, you have the greatest supply of raw materials for manufacturing known to any region in the world.

"Everybody talks about the South's supremacy in the world's cotton production, but very few people quite understand what this supremacy really means. It is worth more to the South, and more to this country, than would be the possession in the South of all the gold and silver mines in the world. If nature had put in your section every ounce of gold and silver that exists in all the earth, it would not have done one-half so much for the real wealth of the South, the prosperity of its people and its influence in world affairs as it did when it gave to the South the power to monopolize the cotton trade. Within the last few years, since you have been getting a fairly decent price for your cotton, notwithstanding my meanness in helping the bears to break down prices in times past, your cotton brings to your farmers about \$1,000,000,000 a year and three-fourths of this comes to you from the North and from Europe. Your cotton crop is like a great funnel, through which in effect all the gold and silver annually mined on earth is poured into the South. Even then Europe has to pick up an additional \$100,000,000 or more and send to you to settle your annual bill for cotton. The gold output of the world is less than \$475,000,000, while Europe pays you a bill of \$550,000,000 to \$600,000,000 for your cotton.

"Civilization is more nearly staked on cotton than on any other one crop. You could find new foodstuffs if wheat and corn were destroyed, for there are other crops which could take their places; but man has not yet found any other substitute for cotton. This country would be bankrupt without it. If we did not get back from Europe the \$500,000,000 or \$600,000,000 which annually comes through the sale of cotton, the balance of trade would be against us; panics would rule the land and industrial depression would be the order of the day. The destruction of any one cotton crop would bring on a panic in this country, as well as in the great textile centers of Europe.

"However, cotton, royal crop that it is, whose empire sways the world, is a crop which the South could abandon with less

loss to itself than to other sections of this country and the world. The South could give up cotton and get rich on diversified agricultural and industrial development. But if the South abandoned cotton, the business of the world would be shaken from center to circumference. Cotton is a national asset; indeed, it is a world asset. It does not belong to the South alone. That section raises it and ought to reap boundless wealth out of it; but cotton is an asset of such priceless value to the nation that it well behooves the nation to safeguard its interests.

"In the last 33 years the value of the South's cotton crop, including seed, aggregated \$16,452,000,000. In the same period the world has produced \$7,634,105,600 of gold and \$3,459,909,642 of silver. The total for these 33 cotton crops exceeded by \$8,817,894,400 the output of the gold mines of the world, and by \$5,357,984,758 the combined values of the output of all gold and silver mines for the same period. During this 33-year period, notwithstanding my effort to help the bears in beating down the price of cotton, the value of the export of raw cotton was \$9,685,282,138, or more than \$2,000,000,000 in excess of the world's output of gold. If it had not been for this enormous shipment of cotton abroad and the billions of dollars which have come back to this country to pay for cotton, our foreign trade would have made an entirely different showing.

"The mechanic in the shops, and the day laborer on the streets of the North and West, the manufacturer, it matters not what he may be making, whether it be locomotives or pins, or where he may be located, the grain grower in the Northwest, the banker and the investor are equally interested, and very vitally so, in watching the weather which foretells whether or not the South is going to give to the world a cotton crop adequate to its needs. No other crop is so closely watched, nor in all the world is there another crop upon which so much of prosperity or of poverty in nearly all lands depends. Here is an asset that can be cashed at any moment in any financial center of the world at any time, regardless of wars or rumors of wars, panics or any other disturbance. By better and more intensive cultivation you can easily double your cotton crop with but little increase in acreage.

#### **Limitless Potentialities for Diversified Agriculture**

"And yet cotton, whose value is beyond description, yields only one-third of the South's agricultural products measured in dollars and cents. You are raising over 1,400,000,000 bushels of grain, and under the system of intensive farming and better fertilization which is now developing you can double your grain crop as easily as you can your cotton without adding an acre to the land in corn or wheat or oats. You can grow a wider diversity of crops to greater profit than any other equal area under the sun.

"There is simply no telling your agricultural potentialities, nor cataloguing the list of things which can be grown to profit nor the crops which cannot be grown in the North or West, but through the cultivation of which you can steadily enrich your soil and restore it to more than original fertility. Your ability to manufacture commercial fertilizers that you may double the yields of your farm lands is unique. I know of nothing else like it in the world. You have the phosphate rock, the limitless supplies of native sulphur, the copper ores whose reduction gives you sulphuric acid as a by-product, your pyrites, your cottonseed and other materials for indefinite expansion of your fertilizer industry. You will see within the next 10 or 15 years the average value of your farm lands exceed the average value of the farm lands of the United States at present, and that will add billions of dollars to your wealth and hundreds of thousands of people will get rich through this enhancement. How many thousands will grow rich through the increase in real estate in cities I would not undertake to guess.

#### **The South the Nation's Main Reliance in Foreign Trade**

"You are beginning your city growth period. You are just getting a little touch of what city activities will be. Birmingham, and Atlanta, Houston, Tampa and Jacksonville, and Chattanooga, and Memphis, and Oklahoma, and a lot of other places are only faint types of what will be seen throughout all the great region from Maryland to Texas in the next 10 or 20 years. Even now you are growing faster than your own people can understand.

Pretty soon the world will begin to capitalize Southern growth, and then there will come a rush of wealth that will amaze you.

"We talk about the cities on the Pacific coast, such as Portland, Seattle, San Francisco and Tacoma as thriving places; but Galveston alone exports nearly twice as much as all the cities on the Pacific coast combined. Last year these Pacific coast ports shipped abroad \$127,000,000 of domestic merchandise, while Galveston shipped \$218,000,000. Even Texas City, a sub-port of Galveston, a place built up in the last few years, handles more export trade, although in Government records it is credited to Galveston, than San Francisco; and more than Portland, Puget Sound, Seattle and Tacoma combined. Savannah exports more than Boston or Philadelphia; New Orleans about as much as Boston, Philadelphia and San Francisco combined. Brunswick, Ga., outranks Portland, Ore., in exports by over \$8,000,000. Savannah ships abroad more than twice as much as San Francisco. Wilmington's exports are three times as great as the exports of Portland, Ore. Mobile, Ala., exports more than four times as much as Portland, Maine, and Tampa, Fla., more than four times as much as San Diego, Cal.

### Foreign Trade Potentialities

"There is a great movement under way for enlarging your port facilities and the creation of new ports and the revival of old ones. From Baltimore and Hampton Roads, where millions are being expended for new piers, down the coast to Charleston, where a million is being invested to handle coal—a new industry for Charleston—on down through Florida ports, which are among the most progressive in the country, to Texas, where existing port facilities are being enlarged and new facilities created at new ports, such as Aransas Pass and Freeport, there is far-reaching development being vigorously pushed.

"Really, I have to depend on the South for nearly one-half of all our exports. Last year 47 per cent. of the value of the exports from the United States originated in the South, and 36 per cent. passed through Southern ports. You have only about one-third of the country's population, but you are furnishing more than 47 per cent. of its exports. The shipments of grain and provisions from the West to Europe are likely to steadily decrease, due to the increasing consumptive requirements at home. The country thus becomes more and more dependent upon the South to protect its export trade upon which its financial safety depends, and the South I know will prove equal to the situation. It matters not how much you may increase your consumption of cotton in Southern mills—and the time will come when Southern mills will use as much cotton as that section now produces—the South can so increase its production as to continue to supply the constantly growing demand for this staple from other parts of the world.

"Your almost limitless coal supply will enable you to become a great exporter of coal. Did you ever stop to consider that the South is the only part of the country that can ever do much in that line? From the mines of Maryland and the Virginias and Kentucky, Alabama and other States, you can ship millions and hundreds of millions of tons annually if foreign needs shall so develop, while the other coal regions of the country cannot reach the seaboard and the foreign markets at a profit. However great the foreign demand for coal may become in the future, the South, and the South alone, is in a position to supply it.

"The South is already shipping many millions of dollars' worth of cottonseed oil and of manufactured cotton, and even highly finished machinery is being exported in ever-increasing quantity. The South will become a great exporter of finished products based on your coal and iron and lumber, your cotton, your cotton seed, your phosphate rock, your oil, your sulphur and other raw materials which give to this section a variety and extent of the things which enter into the widest diversity of manufacturing; that furnish a sure basis for the broadest industrial development that can be found anywhere on earth. Your long stretch of sea-coast, with your splendid bays and rivers reaching far into the interior; your fine harbors, your proximity to the Panama Canal, and thus to the markets of the Pacific, make your geographic location not only very far ahead of any other part of the United States, but really of any other part of the world.

### Uncle Sam Sums Up the South's Advantages

"Briefly," added Uncle Sam in conclusion, "I may say: Your section combines—

"First, the advantages of limitless agricultural potentialities.

"Second, unequalled natural advantages for manufacturing and facilities for assembling and distributing by water or rail to the West on one side out to the Orient, and to the East and Europe on the other side.

To these points in your favor you add health conditions, due to climatic advantages ranging from the cold of the high mountains of Western Carolina and Texas to the soft and balmy air of the Gulf coast, meeting every requirement of those who want a strong, bracing, cold climate, or those who prefer the balminess of the semi-tropics, giving to this section a commanding situation for health and pleasure seekers not to be found in any other part of the United States.

"Summing up a few things I find that:

"The South is now producing three times as much cotton as the rest of the world.

"It is mining more than half of the sulphur produced in the world, and by reason of the cost of production is dominating the world's sulphur trade.

"It is supplying a very large proportion of the phosphate rock which makes possible the fertilizer industry of Europe as well as of this country.

"It is producing one-half of the timber annually cut in the United States, and it is beginning to turn much of this into the finished product.

"It is mining 132,000,000 tons of coal a year, which is 80 per cent. more than the United States produced of bituminous and anthracite coal combined in 1880, and as much as the entire country produced of bituminous coal in 1893.

"It is making almost as much pig iron as was produced by the whole country in 1880, and it is beginning to turn a large part of this into steel rails, pipe, machinery and other finished products.

"It is making steel which is not surpassed as to quality by any other steel made in the country.

"It is shipping largely over \$100,000,000 worth of early fruits and vegetables from its trucking farms and its orchards to the North and West, and this business has grown at a rate which guarantees that within a few years its volume will be doubled.

"It is now developing its water powers at an actual outlay of about \$150,000,000, and it is probably safe to say that the water-power enterprises now under way and projected will require an expenditure of over \$200,000,000 of actual cash.

"It is producing \$3,300,000,000 in agriculture, which is two and a half times as much as its agricultural output in 1900, and \$840,000,000 more than the value of the farm crops, not including cattle products, of the United States in 1890.

"It has more than \$700,000,000 greater manufacturing capital than the United States had in 1880, and is adding to its industrial development at a rate which insures far more rapid advancement in the next 10 years than during the last 25.

"These are a few of the things that have impressed me with what the South is, what it has done and what it is going to do. The more I have studied the matter, the more I am impressed with the fact that the South is indeed the nation's greatest asset. Any man of ordinary common sense who will study the situation as I have done will come to the same conclusion.

"The development of the South will add to national wealth, to national progress, to national solidity, to a greater extent than any but the most far-seeing men could even dream of.

"Indeed, the South is not only the nation's greatest material asset; it is the world's greatest asset, and its development will enrich the world. Without its cotton, beggary would stalk the streets of Europe and millions would starve.

"The South is to be the land of promises fulfilled; the Eldorado of American activity; the focusing point of the world's commerce and industries.

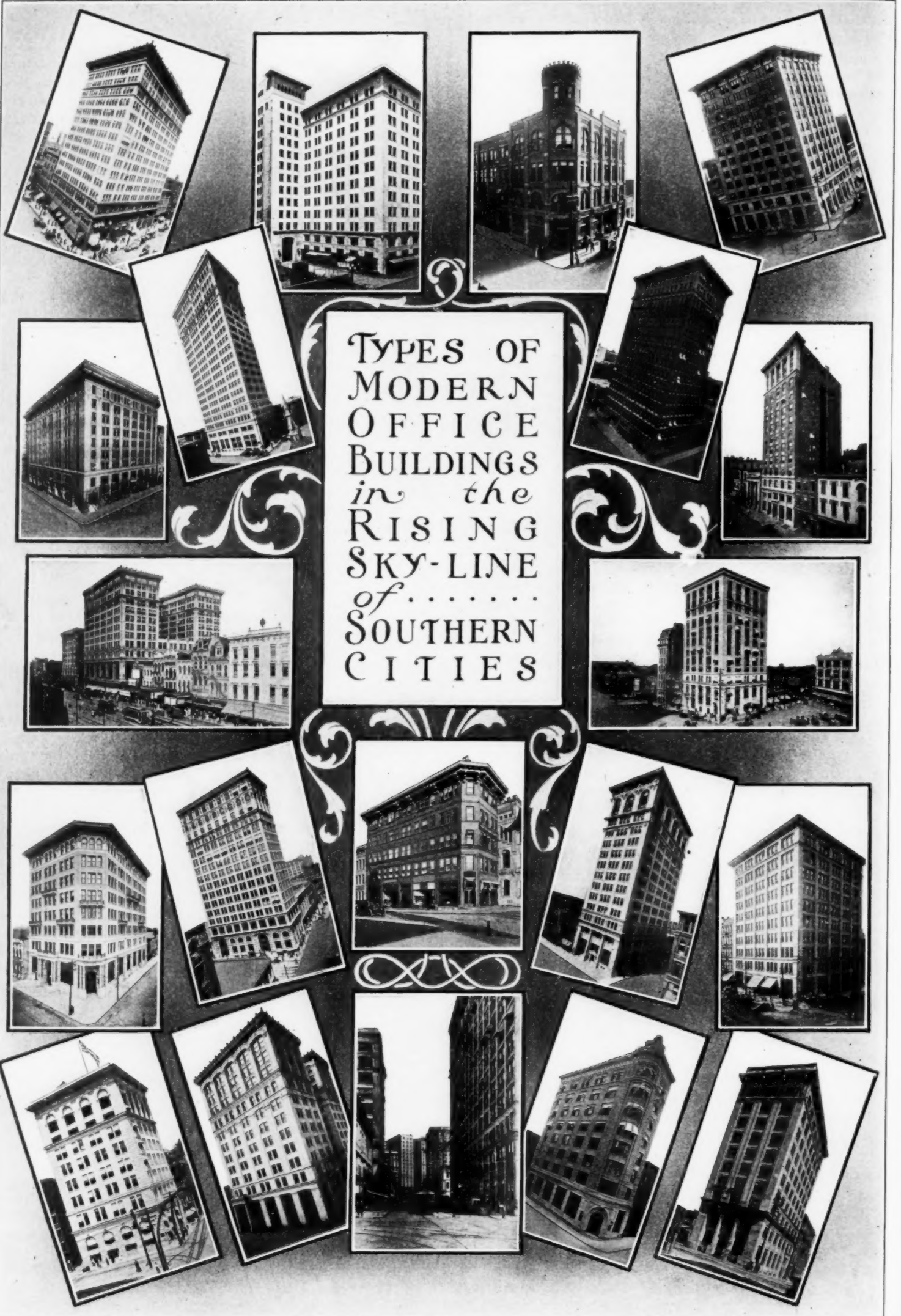
"To the intelligent people of this country and the law-abiding people of Europe I would say, 'Go South.'

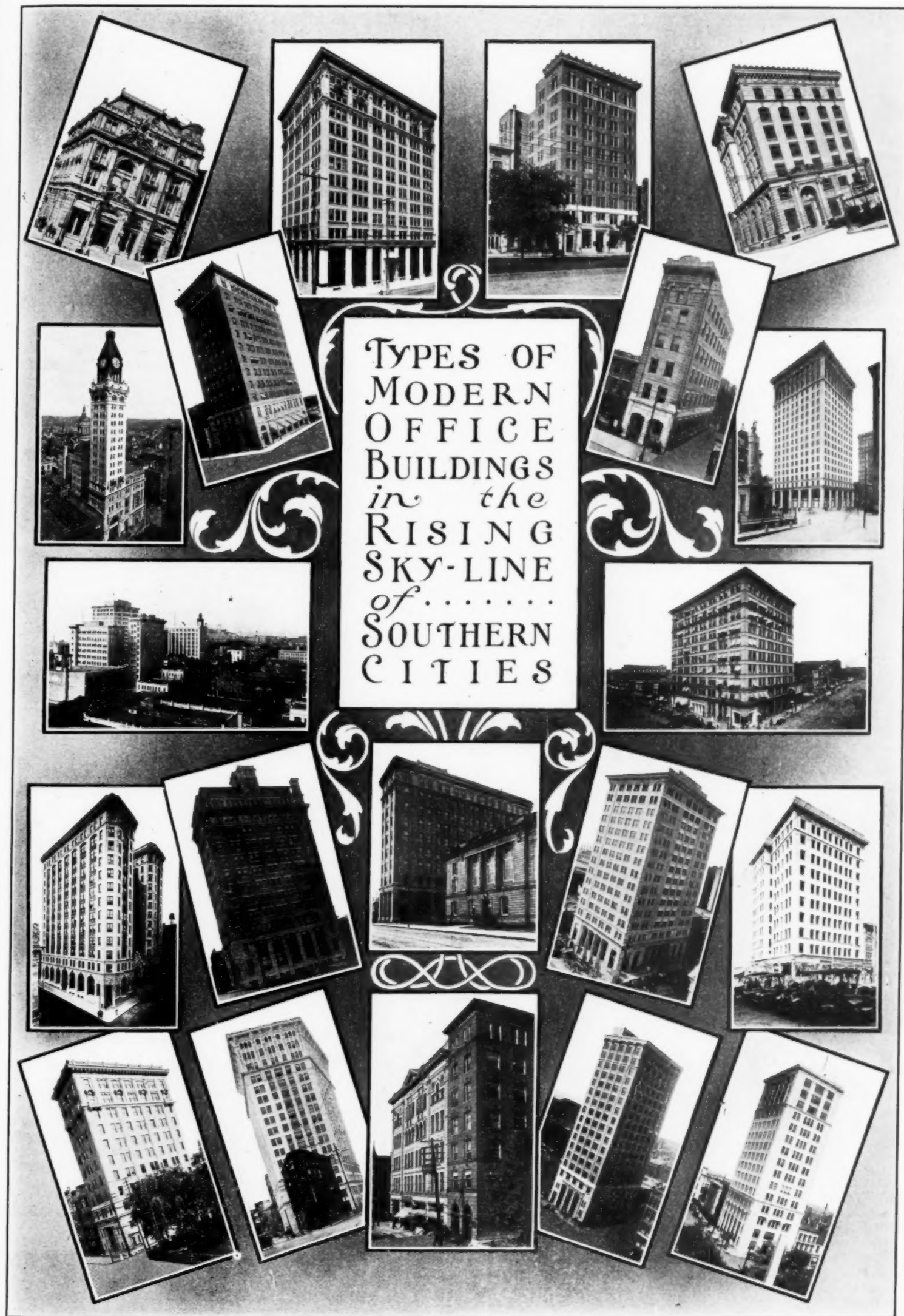
"To the capital of the world I would say, 'Invest South.'

"Thank you, Uncle Sam," said the MANUFACTURERS RECORD. "We may come again and get you to tell our readers other things about the South."



TYPES OF  
MODERN  
OFFICE  
BUILDINGS  
*in the*  
RISING  
SKY-LINE  
*of.....*  
SOUTHERN  
CITIES







# Life Insurance in the South

By President WILMER L. MOORE of the Southern States Life Insurance Co., Atlanta.



HE president of a large Eastern life insurance company at a recent meeting read a paper, and among other interesting statements, said: "The assets of companies doing business in the State of New York were \$24,000,000 in 1860; \$418,000,000 in 1880; \$1,724,000,000 in 1900; \$3,943,000,000 in 1911. Who can tell what these figures will be at the end of the next fifty years?"

There are in the entire country two hundred and fifty-six companies, of which all except eighty-four have been organized since 1904, largely as a result of the upheaval in life insurance circles brought about by the Armstrong investigation. These companies have assets of \$4,162,644,712, a business in force of approximately eighteen billions of dollars, and a total annual income of \$834,413,254. New York State—and this means practically New York City—has eleven life insurance companies, with assets of \$2,250,341,924 (last available figures as of December 31, 1911). These figures will show a vast increase when the companies make their annual statement for the year 1912. These eleven companies have a business in force of almost \$8,000,000,000.

Of the two hundred and fifty-six companies, eight are in Massachusetts, and have \$274,082,154 of assets and \$1,411,005,692 of business in force.

Six are in Connecticut, with assets of \$285,407,136 and a business in force of \$1,009,260,914.

Ten are in Pennsylvania, with assets of \$265,908,762 and a business in force of \$1,099,567,408.

Five are in New Jersey, with assets of \$409,449,004 and a business in force of \$2,650,232,173.

I shall not attempt to cover the other States, having a smaller number of companies, or having a larger number of small companies, but will ask the reader:

How much of these millions of assets was contributed by the sixteen States geographically classified as composing the South?

Think it over. Study this situation and arrive at a conclusion as to what this means to a section of the Union by nature destined to be its wealthiest part.

A question which will naturally interest those who are looking to the future of the South is: What part have the sixteen Southern States taken in the encouragement and development of a business that is now and will continue to be one that means more to a State and a section in which its home office is located than any other interest?

There are in the Southern territory eighty companies, with assets of \$64,243,410 and a business in force of \$650,271,036. These companies are distributed as follows: Alabama, 3; Florida, 2; Maryland, 5; North Carolina, 6; Tennessee, 6; West Virginia, 2; Arkansas, 4; Kentucky, 5; Mississippi, 1; Oklahoma, 5; Texas, 21; Georgia, 5; Louisiana, 1; Missouri, 8; South Carolina, 1, and Virginia, 5.

The oldest of these is a company doing largely an industrial business in Virginia. This was established in 1871. It has assets today of over eight millions and a business in force of over eighty millions of dollars.

Prior to 1880 the people of the South devoted but little of their energies to other than agricultural lines. The wonderful progress of our section dates from that year, hence I will use that as the period for the history of life insurance. January, 1880, there were in the South eleven companies, distributed as follows: Alabama, 2; Louisiana, 1; North Carolina, 1; Georgia, 1; Maryland, 2; Virginia, 1; Kentucky, 1, and Missouri, 2.

These eleven companies had a business in force of over twenty millions of dollars, assets of \$5,673,122 and a premium income of \$790,272.

The number of companies in the entire country in 1880 was thirty-four, with assets of \$128,332,871, having a premium income of \$53,972,388 and a business in force of \$1,524,609,734. The written business for that year was \$235,589,538.

Compare the following with the above figures:

The total business written by all life insurance companies in the sixteen Southern States during the year 1911 amounted to \$576,968,257. They had a total business in force in these States of \$2,893,784,393 and a premium income therefrom of \$94,764,283.

Of the amount written from these States, the Southern companies received \$170,049,315; they have a business in force in these States of \$420,952,706, and a premium income therefrom of \$14,048,177.

The scientific basis upon which reserves must be set aside to properly protect policy contracts will demand an increased accumulation of the assets of life insurance companies. With the writing of a larger volume of business each year this increase of assets will grow in the future at a more rapid ratio than in the past. What will be the ultimate result of this concentration of wealth in the five States of New York, Massachusetts, Connecticut, Pennsylvania and New Jersey? What is the remedy?

Every State should have one or more strong and properly managed life insurance companies. The people should give to such organizations their full support and endorsement.

Companies operating in States other than the home companies must be encouraged to invest their full reserves on all policies written by them in such States.

There are two methods employed to attract such investments—one, the Texas plan, known as the Robertson Law; the other, the inducement method, as employed by the State of South Carolina. The latter is optional with the management of the company. The former is compulsory.

The organization and successful building of life insurance companies in a State ranks next in importance to that of its railroad and banking interests,

viewed from the standpoint of the assistance it gives to the development of the varied interests and resources of the State in which the company's home offices are located.

## NATIONAL BANKING IN THE SOUTH.

	The South.	United States.
1880.....		
Aggregate resources..	\$194,084,459	\$2,105,786,626
Capital .....	\$53,888,930	\$466,365,085
Individual deposits....	\$73,124,523	\$873,537,637
1890.....		
Aggregate resources..	\$463,279,488	\$3,141,487,495
Capital .....	\$114,817,030	\$650,447,235
Individual deposits....	\$212,886,281	\$1,564,845,175
1900.....		
Aggregate resources..	\$705,827,594	\$5,048,138,499
Capital .....	\$106,503,970	\$630,299,031
Individual deposits....	\$334,649,681	\$2,508,248,558
1910.....		
Aggregate resources..	\$1,830,695,231	\$9,956,476,831
Capital .....	\$225,698,230	\$1,004,288,107
Individual deposits....	\$899,203,608	\$5,304,788,306
1912.....		
Aggregate resources..	\$2,112,716,913	\$10,965,788,618
Capital .....	\$242,799,990	\$1,045,092,580
Individual deposits....	\$1,059,068,475	\$5,944,561,070

## DEPOSITS IN SOUTHERN FINANCIAL INSTITUTIONS OTHER THAN NATIONAL BANKS.

	The South.	United States.
1880.....	\$117,440,491	\$1,319,094,576
1890.....	\$208,219,467	\$2,514,077,249
1900.....	\$346,803,574	\$4,780,893,692
1910.....	\$1,056,738,601	\$9,996,179,942
1912.....	\$1,263,836,287	\$11,198,606,444

## SOUTHERN LUMBER PRODUCTION BY DECADES.

(Feet, board measure.)

	The South.	United States.
1880.....	3,810,038,000	18,125,432,000
1890.....	6,460,984,000	23,494,853,000
1900.....	14,444,965,000	35,067,595,000
1910.....	21,235,437,000	40,018,282,000

### INCREASES.

	—The South—		—United States—	
	Amount.	Per ct.	Amount.	Per ct.
1880-1890 . .	2,650,946,000	69.6	5,369,421,000	29.6
1890-1900 . .	7,983,981,000	123.5	11,572,742,000	49.3
1900-1910 . .	6,790,472,000	47.	4,950,687,000	14.1

## SOUTH'S LUMBER CUT.


(Feet Board Measure.)

States.	1880.	1890.	1900.	1911.
Ala..	251,851,000	586,143,000	1,096,539,000	1,226,212,000
Ark..	172,503,000	526,091,000	1,595,933,000	1,777,303,000
Fla..	247,627,000	411,436,000	788,905,000	983,824,000
Ga..	451,788,000	572,970,000	1,308,610,000	801,611,000
Ky..	305,684,000	420,820,000	765,343,000	632,415,000
La..	133,472,000	303,591,000	1,113,423,000	3,566,456,000
Md..	123,336,000	82,119,000	183,393,000	144,078,000
Miss.	168,747,000	452,797,000	1,202,334,000	2,041,615,000
Mo..	399,744,000	395,755,000	723,754,000	418,586,000
N. C..	241,822,000	509,436,000	1,278,399,000	1,798,724,000
Okla..	.....	2,552,000	22,104,000	143,869,000
S. C..	185,772,000	197,940,000	466,109,000	584,872,000
Tenn.	302,673,000	450,097,000	939,463,000	914,579,000
Tex..	328,968,000	839,724,000	1,230,904,000	1,681,080,000
Va..	315,939,000	409,804,000	956,169,000	1,359,790,000
W. Va.	180,112,000	299,709,000	773,583,000	1,387,786,000

Tl.	3,810,038,000	6,460,984,000	14,444,965,000	19,462,800,000
U.S..	18,125,432,000	23,494,853,000	35,067,595,000	37,003,207,000

## Inventory of Individual Southern States

Diversity of Their Assets Shown in the Figures of  
Production Since 1880

OTABLE progress since 1880 in the utilization of the natural resources of the South is recorded statistically in the following thirty-three pages. The figures presented for individual States by decades reflect the vast possibilities of the South. Facts as to achievements and as to resources that cannot be tabulated for all the States or for all the years do not appear in the statistics, but reference is made to them, at some length, in special articles on preceding pages of this issue, or in the condensed summary of leading features of each State accompanying the tables.

No effort has been made to give encyclopedic range to the State summaries, each of which could readily be expanded into an extensive and interesting volume. The aim has been to present briefly the essential facts.

Wherever possible, official figures have been used in the tables and, in the absence of such, especially in the 1912 column, conservative estimates. In studying the figures it must be borne in mind that there is some overlapping of forest products and factory products, and also of mineral products and factory products, and that the figures of some agricultural productions are as of the year preceding the census year.



## Statistical Survey of the South and The United States

## THE SOUTH.

Land Area, 945,088 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	18,614,925	22,538,751	27,445,457	*33,475,000
Manufactures: ‡				
Capital .....	\$329,753,000	\$848,868,000	\$1,408,866,000	†\$2,883,929,000
Products—value .....	\$622,840,000	\$1,242,581,000	\$1,860,113,000	†\$3,158,399,000
Cotton Mills:				
Spindles .....	687,066	1,719,600	4,467,383	11,859,000
Looms .....	14,754	39,445	113,106	252,000
Cotton used, pounds .....	111,777,177	279,728,025	749,915,066	1,319,708,000
Cottonseed Oil Mills:				
Products, value .....	\$6,797,261	\$15,961,090	\$56,269,746	†\$106,292,000
Pig-iron made, tons .....	448,978	1,833,937	2,642,720	3,054,980
Coke made, tons .....	373,982	2,548,245	5,839,612	*7,974,000
Lumber cut, feet .....	3,810,038,000	6,460,984,000	14,444,965,000	†19,462,800,000
Forest products—value .....	\$75,215,000	\$178,689,000	\$332,583,000	\$652,153,000
Agriculture:				
Capital .....	\$2,762,076,984	\$3,923,560,480	\$5,262,278,962	*\$12,102,000,000
Products—value .....	\$756,043,000	\$876,452,000	\$1,564,069,000	*\$3,297,000,000
Improved farm lands, acres .....	101,975,175	126,995,853	148,254,126	\$173,982,000
Cotton crop, running bales .....	5,756,726	7,473,384	9,508,110	*14,082,000
Grain, bushels:				
Corn .....	627,288,000	625,600,000	671,509,000	1,135,939,000
Wheat .....	84,866,000	60,883,000	130,863,000	98,086,000
Oats .....	80,515,000	86,098,000	108,693,000	137,865,000
Livestock:				
Cattle .....	14,189,000	17,769,568	25,224,000	20,718,000
Sheep .....	10,365,000	9,601,537	8,652,000	8,975,000
Swine .....	21,132,000	20,917,736	23,086,000	25,075,000
Mineral products, value .....	\$18,225,508	\$60,217,825	\$129,857,303	*\$385,700,000
Coal mined, tons .....	7,002,254	24,925,345	54,510,460	131,970,000
Iron ore mined, tons .....	702,515	3,516,202	4,748,815	*5,736,000
Petroleum, barrels .....	179,000	498,910	17,102,047	84,800,000
Phosphate, tons .....	190,763	510,499	1,489,907	*3,400,000
Railroad mileage .....	24,866	50,350	61,880	90,930
Exports .....	\$264,905,753	\$311,742,748	\$484,651,682	\$769,679,000
National Banks:				
Resources .....	\$194,084,459	\$463,279,488	\$705,827,594	\$2,112,716,913
Capital .....	\$53,888,930	\$114,817,030	\$106,503,970	\$242,799,990
Individual deposits .....	\$73,124,523	\$212,886,281	\$334,649,680	\$1,059,068,475
Other banks, deposits .....	\$117,440,491	\$208,219,467	\$346,803,574	\$1,263,836,287
Common school expenditures .....	\$12,471,404	\$24,605,107	\$35,037,993	\$880,863,000
Property, true value .....	\$9,177,000,000	\$13,756,485,000	\$17,919,200,000	*\$28,000,000,000

## UNITED STATES.

Land Area, 2,974,159 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	50,395,919	62,947,714	75,994,575	*95,948,000
Manufactures: ‡				
Capital .....	\$2,790,273,000	\$6,525,051,000	\$9,831,487,000	†\$18,428,270,000
Products—value .....	\$5,369,579,000	\$9,372,379,000	\$13,010,037,000	†\$20,672,052,000
Cotton Mills:				
Spindles .....	10,653,435	14,188,103	19,050,952	30,579,000
Looms .....	225,759	324,866	455,752	710,000
Cotton used, pounds .....	750,343,981	1,117,945,776	1,817,643,390	2,587,662,000
Cottonseed Oil Mills:				
Products, value .....	\$7,690,921	\$19,335,947	\$58,726,632	†\$107,538,000
Pig-iron made, tons .....	3,835,191	9,202,703	13,789,242	29,727,137
Coke made, tons .....	3,338,300	11,508,021	20,533,348	*41,000,000
Lumber cut, feet .....	18,125,432,000	23,494,853,000	35,067,595,000	†37,003,207,000
Forest products—value .....	\$388,781,000	\$743,391,000	\$944,718,000	\$1,200,000,000
Agriculture:				
Capital .....	\$12,104,001,538	\$15,982,267,689	\$20,514,002,000	*\$45,000,000,000
Products—value .....	\$2,212,541,000	\$2,460,107,000	\$4,717,070,000	*\$9,532,000,000
Improved farm lands, acres .....	284,771,042	357,616,755	414,498,487	\$477,448,000
Cotton crop, running bales .....	5,756,726	7,473,384	9,508,110	*14,200,000
Grain, bushels:				
Corn .....	1,717,435,000	1,489,970,000	2,105,103,000	3,169,137,000
Wheat .....	498,550,000	399,262,000	522,230,000	720,333,000
Oats .....	417,885,000	523,621,000	809,126,000	1,417,172,000
Livestock:				
Cattle .....	34,932,000	50,246,078	67,719,000	57,959,000
Sheep .....	42,192,000	35,935,364	61,504,000	52,362,000
Swine .....	47,682,000	57,409,583	62,868,000	65,410,000
Mineral products, value .....	\$364,928,298	\$606,476,380	\$1,107,031,392	*\$2,075,000,000
Coal mined, tons .....	71,481,570	157,770,963	269,684,027	550,000,000
Iron ore mined, tons .....	7,100,000	16,036,043	27,553,161	*51,600,000
Petroleum, barrels .....	26,286,123	45,823,572	63,620,529	220,000,000
Phosphate, tons .....	211,377	510,499	1,491,216	*3,400,000
Railroad mileage .....	93,262	166,703	194,321	252,000
Exports .....	\$835,638,658	\$857,828,684	\$1,394,483,082	\$2,204,322,000
National Banks:				
Resources .....	\$2,105,786,626	\$3,141,487,495	\$5,048,138,499	\$10,965,788,618
Capital .....	\$466,365,085	\$650,447,235	\$630,299,031	\$1,045,092,580
Individual deposits .....	\$873,537,637	\$1,564,845,175	\$2,508,248,557	\$5,944,561,070
Other banks, deposits .....	\$1,319,094,576	\$2,514,077,249	\$4,780,893,692	\$11,198,606,444
Common school expenditures .....	\$78,094,687	\$140,506,715	\$214,964,618	\$8426,250,000
Property, true value .....	\$43,642,000,000	\$65,037,091,000	\$88,517,307,000	*\$138,000,000,000

\*Partly estimated. †1909. ‡1911. §1910. ¶Hand-trades and neighborhood industries not included in 1909.

# ALABAMA

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	\$13,566,000	\$51,227,000	\$80,741,000	\$180,000,000
<b>Farms.....</b>	\$56,873,000	\$66,240,000	\$91,387,000	\$184,186,000
<b>Forests.....</b>	\$4,416,000	\$14,373,000	\$21,446,000	\$40,860,000
<b>Mines.....</b>	\$779,000	\$6,906,000	\$13,702,000	\$46,000,000

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



ALABAMA, in respect of geographical position, soil, climate and other resources, holds an enviable place among the States. North and south it stretches from the sub-tropic temperature of Northern Florida to the cool heights of the Appalachian range; east and west from the rich loamy soils of the western border of Georgia to the fertile valley of the Tennessee. It lies between 31 degrees and 35 degrees north latitude and 85 degrees and 89 degrees west longitude, and the altitude runs from a few feet above sea level on the Gulf coast to 3000 feet of elevation on the mountain heights, the average being about 600 feet. The area is 51,998 square miles, or 6872 square miles larger than Pennsylvania. Of this area, 719 square miles are covered by water. There are 32,818,560 acres, of which less than 10,000,000 are improved.

The richness of its soil resulted in Alabama's development, for many years being mainly along agricultural lines, though even prior to the war considerable progress had been made in industrial pursuits, and especially in iron production. The iron ore and coal resources of the State were fully appreciated by many antebellum leaders, but large development operations then would have been in advance of the times, since in 1860 the total production of bituminous coal in the United States was 6,494,200 tons, and the total output of iron ore 2,873,460 tons. The destruction by war made it almost impossible to revive industrial pursuits on a large scale until late in the seventies, when progressive men of the State undertook development of the vast resources of the Birmingham and Anniston iron districts.

The State is divided into two general districts, the mineral and the agricultural. The mineral extends over most of the northern portion. The soils here are principally residual, being made up of the disintegration from the rocks upon which they rest, with sandy loams on the lower levels, highly fertilized by large proportions of limestone and clay. In the valleys of the Coosa and Tennessee the soils are extremely rich and of high excellence for all branches of husbandry. On the lower levels of the southern portion of the State, the coastal plain, the soils generally are sandy loams and pebbles, mixed with marl, forming many varieties, all of exceptional fertility. The famous "black belt" of Alabama, so called from the very black soil that abounds, lies in this district, embracing a wide area of lands not excelled elsewhere for general agriculture. These soils are all adaptable to a wide range of agricultural purposes. The soils of that portion of the coastal plain bordering on the Gulf of Mexico can be made to produce prolifically of almost every crop known to that latitude. They are especially adapted to the production of trucking crops, covering a wide variety of early fruits and vegetables. In this section, as in other portions of the South, pecan growing has been making rapid progress of recent years.

In agriculture Alabama spreads over almost the entire range. For many years after the war, as in the other Southern States, attention was given to the raising of cotton to the exclusion of the diversified farming as successfully conducted prior to 1860, so that for many years corn growing and livestock raising dropped far behind the conditions prevailing before the war. Of recent years, however, while there has been an increase in the amount of cotton produced in the State, its relative importance has greatly decreased, while that of other crops has increased in the same proportion. Moreover, attention is now being given to the raising of corn, oats, alfalfa and the various grasses and forage crops, with the result that vast amounts of money formerly sent to other States for the purchase of such things are now kept at home. The production of foodstuffs, however, is not yet equal to the local demand, and Alabama, like other Southern States, still buys largely of Western grain, provisions, and even hay. The opportunity for diversified farming and the increase in the production of these foodstuffs is thus strikingly indicated.

In the southern part of the State trucking has been carried on as a commercial business for some years, and with large success. The crops produced include practically all the vegetables used on the table, which go into the market at the same time with those from Northern Florida. Figs, peaches, berries of all kinds, grapes and many other fruits grow well in the various portions of the State.

Alabama is well watered by a number of rivers of unusual importance, and by the numerous streams that take their rise in the mountain districts of the northern portion. The average rainfall is high, and no element is lacking to make the State one of exceptional opportunities for agriculture. These rivers

also furnish sites for water-powers of enormous potentiality, as well as water transportation, which will be still further bettered by the improvements now being made by the national Government at an expense of many millions of dollars, which, when completed, will result in providing water transportation facilities scarcely equaled by any other State in the Union, putting the vast mineral regions tributary to the Warrior, the Coosa, the Tennessee and other rivers, whose valleys are among the most fertile in the country, in possession of splendid water routes to the Gulf.

Compared with what will be done in the future, there has been little development of water-power in the State, but plans have been made for extensive work along that line, notably by the Alabama Interstate Power Co., a \$55,000,000 concern financed in England, that controls sites with potentiality of about 400,000 horse-power. This company is now developing about 100,000 horse-power and will continue the improvement of the water-power sites controlled until it has practically covered the State with a network of transmission lines. Other developments have been made, and others will be made until the great water-power potentialities of the State are utilized. It is officially announced that the English capitalists who have financed the Alabama Interstate Power Co. will take a very active part in the development of industrial and interurban railways throughout the State, with a view to creating a market for all of the power that they can develop, recognizing, as they do, the unusual advantages of Alabama for the widest variety of industrial operations.

Over large areas of the State virgin forests still stand, the forest district being estimated at about 20,000,000 acres at present. The pine belt extends from the Gulf of Mexico to about 150 miles north, and contains vast quantities of timber. There are extensive tracts of pine also in the northern part. The hardwoods are found in practically all portions of the State. Along the streams and on the mountains are large quantities of oaks, gum, hickory, cypress, poplar, ash, maple and other merchantable woods. The lumber cut of the State is about 1,500,000,000 feet a year, or nearly three times the output of 1890.

In extent of its resources in iron ore, coal and limestone, taken in connection with their proximity to each other, Alabama is probably the most richly endowed region in this respect in the world. There are other regions having enormous resources in iron ore and in coal, but probably nowhere else is the available quantity, which can be assembled at so short a haul, so great. The State has 8430 square miles of workable coal fields, which is more than the entire coal area of England. It has, according to the United States Geological Survey, more than 1,000,000,000 tons of red ore above the 1000-foot level, and has in addition several hundred million tons of brown ore and of gray ore. Ore experts, basing their reports on recent diamond drill borings, which have vastly increased the proven supply of ore in the Birmingham district, make the available supply of red ore very much larger than the estimate made several years ago by the Geological Survey. Alabama is now producing about 2,000,000 tons of pig iron as compared with a total production of the United States in 1880 of 3,835,000 tons, being more than one-half as much as the entire country then made. And yet the iron and steel development of Alabama is in its infancy as compared with its potentialities. The United States Steel Corporation has an investment in Alabama, including the bonds of the property which it bought, namely, the Tennessee Coal, Iron & Railroad Co., of about \$60,000,000; but it owns in that State more iron ore and several times as much coal as its total holdings of ore and coal when it was organized. It does not, however, have anything like a monopoly of the iron ore of the State, for independent iron and iron ore companies hold a very much larger quantity in the aggregate than the Tennessee Coal, Iron & Railroad Co., and its holdings of coal are small as compared with the total available coal of the State. This company and the Woodward Iron Co. have recently built at an expenditure of more than \$4,000,000 by-product coke ovens, which have greatly lessened the cost of iron making, thus putting Alabama on a parity with the most advanced metallurgical sections of this and other countries. The coal production of the State is now in the neighborhood of 17,000,000 tons a year. The Ensley steel plant of the Tennessee Coal, Iron & Railroad Co. is producing steel rails equal in quality to any made in the country, while the steel plant of the Southern Iron & Steel Co., at Gadsden, is producing high-grade steel and turning it into wire and other finished products. The American Steel & Wire Co., a subsidiary of the Steel Corporation, has erected adjoining Corey, a short



distance from the Ensley steel plant, buildings which have cost about \$3,000,000, intended for a steel wire plant, but there has been a delay in the equipment of the plant, and it is possible that the Steel Corporation may eventually decide to utilize it for some other form of finished steel product.

Outside of iron ore, coal and limestone, Alabama is almost equally as liberally endowed in other mineral resources, including marbles and other building stones, clays, gold, copper, barytes, corundum, graphite, ochre, bauxite, mica, pyrites, phosphate rock, glass sand, limestones and shales for cement making, dolomite and others of numerous kinds and useful for various purposes, many of which are being profitably operated at present. In building stones Alabama is peculiarly rich in high-grade marbles and granites and other structural and ornamental stones. A leading expert, for many years connected with the United States Geological Survey, has recently said that Alabama will eventually far surpass Vermont in the marble industry. It has vast deposits of marble of the highest quality, ranked by experts as equal to the best Carrara. In clays its possessions range from those used in making brick, tile and sewer pipe to high-grade kaolins used in making the best pottery.

The industrial development of Alabama covers a very wide range of activities. The production of pig-iron has been followed by the rapid expansion of manufacturing enterprises consuming pig-iron. This is especially notable in the case of iron pipe making in which there are many active concerns of very large capacity using a very considerable proportion of the iron product of the State in making water and gas pipe, the market for which extends from the Atlantic to the Pacific coast. Cotton manufacturing has made very marked progress, and the State now has nearly 1,000,000 spindles and 17,000 looms, ranking fourth in the list of cotton manufacturing States of the South. Cement making has become a large industry with plants located at various points in the State, the supply of cement-making material being apparently inexhaustible. There are numerous marble and granite quarrying operations, some of which are conducted on a very large basis. This is especially true in the marble interests, the demand for high-grade Alabama marble for interior work for the most expensive office buildings and private residences in the North being very great. Kaolin deposits are found in many places, some of the output being of the quality used in high-class ware, while in other sections porcelain clay is found in large quantities. Clays for ordinary pottery, brick, tile and sewer pipe are found in many sections of the State, and large brick plants are located in Birmingham and elsewhere. Quantities of sewer pipe are also made.

The growth in manufacturing development is indicated in the advance of capital invested in factories from \$60,166,000 in 1900 to \$173,000,000 in 1909. Between 1900 and 1910 the value of farm lands and buildings advanced from \$135,000,000 to \$288,000,000. Between 1900 and 1912 the production of corn rose from 29,000,000 bushels to 54,000,000 bushels, and the resources of national banks from \$19,000,000 to \$67,000,000. The wealth of the State increased from \$774,000,000 in 1900 to \$1,200,000,000 in 1911.

In the matter of transportation Alabama has 5400 miles of railroad, while

considerable activity is now seen in the building of new lines and the betterment of existing roads by double-tracking and the reconstruction of other lines in order to put them in shape to meet the rapidly increasing traffic. This State, moreover, has very considerable water transportation facilities at present, and will have through the improvement of its chief rivers exceptional water routes scarcely equalled, when the projected work by the Government has been completed, by any other State. The improvement of the Warrior River, upon which some millions of dollars have already been expended, will give all the year round water transportation from the Warrior coal fields, but a short distance from Birmingham, direct to Mobile, putting this great mineral territory in closer proximity by water transportation to the Gulf, and thus to the outside world, than is now enjoyed by any other coal field in the United States. A very great increase in coal shipment down the river to Mobile for bunker purposes, for shipment coastwise to New Orleans and other points, and for foreign trade, upon completion of the Panama Canal is expected to follow the broad plans which are now being worked out for a barge system to operate from the Warrior River to New Orleans designed to handle coal on a large scale.

In education Alabama is making rapid progress. It has a good public school system to which it is now devoting more than \$2,500,000 annually. In addition to the common schools, the system includes high schools, normal schools, a polytechnic school and a university. The Polytechnic Institute and the State University are of very high grade and are doing very broad educational work.

The State is rapidly improving its public roads, and in various counties much money is being spent in that work, several million dollars having been raised in the last few years by bond issues for the betterment of the roads of the State, and recently there has been considerable agitation in favor of a State bond issue of \$50,000,000 for this purpose.

Considering its unusual combination of coal and iron and marbles and granites and cotton manufacturing potentialities, its remarkable water transportation possibilities by reason of the many large rivers that flow through the State, its varied agricultural capabilities, Alabama is destined of necessity to be one of the greatest centers of industrial and agricultural activities in America.

Birmingham, the largest city in the State, gained 245 per cent. in population between 1900 and 1910. It seems certain to become one of the greatest metallurgical centers of the world, but to the vast developments, based on coal and iron and steel, it adds a wide diversity of industrial and commercial interests. Mobile, as the chief port of the State, has grown rapidly in its foreign commerce and promises to share largely in the benefits to follow the opening of the Panama Canal. Montgomery, Anniston, Gadsden and other thriving towns and cities are making marked progress. In Corey, near Birmingham, Alabama has one of the finest examples in America, if not in the world, of a scientifically designed and built town intended largely for skilled workmen.

#### ALABAMA SUMMARIZED STATISTICALLY.

##### Land Area, 51,279 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,262,505	1,513,401	1,828,697	*2,200,000
Manufactures: ‡				
Capital .....	\$9,668,000	\$46,123,000	\$70,370,000	†\$173,180,000
Products—value .....	\$13,566,000	\$51,227,000	\$80,741,000	†\$145,962,000
Cotton Mills:				
Spindles active.....	49,432	79,234	411,328	971,144
Looms active.....	863	1,692	8,549	17,823
Cotton used, pounds.....	7,271,791	14,726,454	67,987,299	126,256,167
Cottonseed Oil Mills:				
Products, value.....	\$247,982	\$1,203,989	\$2,985,890	†\$8,714,000
Pig-iron made, tons.....	68,919	816,911	1,184,337	1,862,909
Coke made, tons.....	60,781	1,072,942	2,110,837	*3,200,000
Lumber cut, feet.....	251,851,000	586,143,000	1,096,539,000	†1,226,212,000
Improved farm lands, acres.....	6,375,706	7,698,343	8,654,991	\$9,687,000
Farm lands, buildings, value.....	\$78,954,648	\$111,051,390	\$134,618,183	\$828,673,000
Agricultural products, value.....	\$56,873,000	\$66,240,000	\$91,387,000	*\$184,186,000
Cotton crop, running bales.....	699,654	915,210	1,095,329	*1,350,000
Grain, bushels:				
Corn .....	22,679,000	25,390,000	29,356,000	53,664,000
Wheat .....	1,402,000	1,319,000	916,000	318,000
Oats .....	2,926,000	4,864,000	4,381,000	5,200,000
Livestock:				
Cattle .....	675,000	778,676	798,000	936,000
Sheep .....	347,000	386,380	317,000	140,000
Swine .....	1,252,000	1,423,884	1,423,000	1,533,000
Mineral products, value.....	\$779,242	\$6,906,439	\$13,701,505	*\$46,000,000
Coal mined, tons.....	323,972	4,090,409	8,394,275	*19,000,000
Iron ore mined, tons.....	68,919	1,897,815	2,759,247	*4,100,000
Railroad mileage.....	1,843	3,422	4,197	5,421
National Banks:				
Resources .....	\$5,036,764	\$15,866,694	\$19,055,381	\$72,709,368
Capital .....	\$1,508,000	\$4,294,000	\$3,480,600	\$9,725,000
Individual deposits.....	\$1,318,889	\$7,024,636	\$10,938,390	\$41,601,123
Other banks, deposits.....	\$2,269,647	\$1,937,377	\$4,588,607	\$44,050,888
Common school expenditures.....	\$500,000	\$890,000	\$923,464	\$82,905,000
Property, true value.....	\$428,000,000	\$622,774,000	\$774,700,000	*\$1,237,000,000

\*Partly estimated. †Not including neighborhood industries and hand trades in 1909. ‡Figures of 1909. §Figures of 1911. ¶Figures of 1910.

# ARKANSAS

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	\$6,756,000	\$22,659,000	\$45,198,000	\$92,000,000
<b>Farms.....</b>	\$43,796,000	\$53,128,000	\$79,649,000	\$168,375,000
<b>Forests.....</b>	\$2,990,000	\$14,905,000	\$39,933,000	\$54,008,000
<b>Mines.....</b>	\$66,000	\$1,130,000	\$2,384,000	\$5,600,000

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



ARKANSAS lies between 33° and 36° 30' north latitude and between 80° 40' and 94° 42' west longitude. It has an area of 53,335 square miles, of which water covers 810. In elevation, it runs from 281 feet on the eastern border to 2340 among the Ozark Mountains on the northern boundary. The rainfall averages 45 inches in the northwestern portion and from 42 to 52 inches in South Arkansas. The total acreage is 33,616,000, of which about one-fifth is improved. The soils range wide, from limestone in the northwest to the black lands of the south and southeast, taking in practically every kind between the two extremes. The lands throughout the eastern and southeastern sections of the State are generally level. On the western border is a broad belt of rolling lands extending along its whole length. Almost all the uplands are susceptible of cultivation, the soil being good and the land well drained. In the low alluvial lands there are some hundreds of thousands of acres that must be drained or protected from overflow before they can be cultivated with success. They are of great fertility and when drained or protected they yield abundantly, and will produce almost any kind of crop planted. Each year sees a considerable amount of swamp land redeemed by drainage. Extensive operations involving the reclamation of some hundreds of thousands of acres are now under way, the bonds issued by the drainage districts for this work having proven very attractive to investors. The agricultural products of the State probably cover as wide a range as those of any State in the Union, embracing practically every field crop and vegetable, and most of the fruits grown anywhere. The principal rivers watering and draining Arkansas are the Mississippi, Arkansas, Ouachita, White, St. Francis, Red, Black, Little Missouri, Little Red and Moro, while Bayou Bartholomew also drains a large area. Some of these rivers are navigable for a large part of their length, the navigable waters reaching several thousand miles. It is estimated that these streams are capable of development to the extent of 1,500,000 horse-power. There are many springs, one of which, Mammoth Spring, in Fulton county, flows 65,000 cubic feet of water a minute. Many mineral springs abound, the better known among them being those at Hot Springs, where the water comes from the ground much too hot for bathing purposes, and which have made that place one of the world's noted health resorts, and at Eureka, where there are some 40 springs said to be of great medicinal virtue. Other mineral springs are Heber Springs, Armstrong Springs and those at Mount Nebo and Winslow.

Arkansas has many minerals, scattered through most of the counties. The coal area is 1684 square miles, and much of the coal is of unusually high quality. There are more than 100 mines being operated in the State, and the capital invested is several millions of dollars. The output of these mines is about 2,000,000 tons annually, most of it being in the counties of Pope, Johnson, Sebastian, Scott, Franklin and Logan.

There are large deposits of bauxite that carry a high percentage of aluminum, and a very large proportion of the aluminum made in this country is from the product of these deposits. They are in Saline county, not far from Little Rock. Other deposits occur in various places, but have not yet been developed. It leads the country in the production of bauxite, which occurs in at least three forms, and many of the hills in the district where operations are in progress are covered with the ore, varying in thickness from that of a knife edge to thirty feet. It is interesting to note that natural gas from Louisiana has been introduced as fuel in the bauxite operations, and that one of the largest hydro-electric developments under way in the South is to be utilized in the derivation of aluminum from bauxite.

Asphalt is mined in a number of places, one being in Pike county, near Murfreesboro. The product is a high grade of asphalt, which is being used in street building in a number of prominent cities throughout the country.

In the northwestern part of the State large deposits of zinc and lead occur, and large sums of money have been spent in developing them. Several mines are in operation and the output is increasing each year. Clays for making fire brick, pressed brick and common building brick abound in all sections and are being utilized in many. There is also potters' clay of high grade. Pottery and brick plants are found in a number of localities. Paint clays exist in large quantities in Pike, Garland and Sharp counties, and there are several factories for utilizing their output. Kaolin, said to be as fine as has been found anywhere in the United States, lies in large deposits in Southern

Arkansas, mostly in Pike county. There are slate deposits in Garland, Montgomery and Polk counties, and mines have been opened up in several places showing a good quality of slate. It is black, green, red, gray and yellow in color.

Great deposits of marble lie in several counties, though but one or two quarries are now being operated. The marble is found in white, black and red, and is of excellent quality. The quantity is very large, and there is little question of the State's becoming an important producer of that stone. It has also extensive fields of onyx of a beautiful quality, as yet undeveloped.

Other mineral deposits are phosphate rock, fullers' earth, soapstone, chalk, lithograph stones and building stones of various kinds. The phosphate deposits are well situated to supply the growing demand for fertilizers west of the Mississippi River, and the increasing consumption of ground phosphate rock for agricultural purposes will probably hasten further development in these fields, the portion of which now being worked lies in the northwestern part of Independence county, though the deposits extend over a considerable area in North-central Arkansas. All the material mined in Independence county is at present shipped to Little Rock to be made into acid phosphate or sold directly to farmers as ground rock phosphate. Phosphate nodules occur in Clark county, but the pebbles have never yet been found in sufficient quantities to be of economic interest. The fuller's earth deposits that have been developed are in an area of about three square miles between Hot Springs and Benton, but it occurs in other sections, and it is possible that new deposits may be discovered. The Arkansas earth is not used in refining petroleum, but it used for bleaching cottonseed oil, hog leaf lard, beef tallow and stearine.

Diamonds have been found in Pike county, and it is thought diamond mining may become a profitable industry. Within recent years it has been discovered that the mussel shells in some of the State's rivers contain pearls of great beauty, some of which are extremely valuable, and the pearl fishing industry and the making of pearl buttons have become of importance in a number of places.

Natural gas has been discovered in the western portion of the State, and a number of wells of large size have been "brought in." Fort Smith and other towns in the vicinity of the field have had the gas piped in and are making use of it as a fuel and in producing light and power. The discovery of gas has already brought to the State a number of manufacturing plants and will unquestionably prove of great aid in building up the industrial interests of the commonwealth.

Arkansas has a timber area of 24,200,000 acres, and the amount of standing timber is estimated at from 30 to 50 billions of feet. The different woods abound in varying quantities in different portions of the State, but as a whole it contains about all the most useful kinds—the oaks, pine, cypress, red cedar, black walnut, butternut, hickory, poplar, cottonwood, beech, birch, elm, cherry, black and red gum, locust, maple, basswood, tupelo, sycamore, osage orange, cucumber, holly, pecan, magnolia. In red gum and hickory, Arkansas is reported as surpassing the other States, and in total output of all kinds stands fifth to Louisiana, Mississippi, Texas and Washington. The annual cut in Arkansas runs well over 1,750,000,000 feet.

Agriculture is much the most important industry of the State, the value of its annual output largely exceeding the value of its manufactured products. Of farm products, cotton is most important in respect of value and attention given. The yield runs close to 1,000,000 bales, one year with another, and the money it brings to the farmers reaches from \$50,000,000 up to \$75,000,000, as the price varies. Cotton is grown in practically all parts of the State. Corn comes next in importance, the crop running close to 60,000,000 bushels, and the value reaching approximately \$40,000,000 annually. All sections unite in the production of corn, the yield in some of them being very large. Potatoes yield prolifically and the product of the State is very large. Especially has there been an impetus in growing potatoes of late years. Yields of 500 bushels of Irish potatoes per acre are reported. Sweet potatoes also yield largely and form an important part of the annual crop. Oats are planted throughout the entire State, and the average yield in 1910 was 27.5 bushels per acre. The farmers of Arkansas have lately begun to pay considerable attention to the production of wheat, and their success has been such as to justify the prediction that wheat will become one of the State's important crops. The



yield per acre averages about 14 bushels, but 25, 30, 35 and even as high as 50 bushels are reported by some farmers. There are numerous flouring mills in the State.

The grasses and forage crops that produce largely in Arkansas are numerous. Alfalfa, but recently introduced into the State, has been found to be a most valuable crop, yielding several cuttings each year that total a large amount of hay per acre. The clovers, lespedeza, cow peas, soy beans and other crops of like character are found highly profitable. Peanuts make a valuable crop, both for the nut itself and for the hay made by the vines.

The rice industry, although practically new to the State, has come into considerable prominence, and added largely to wealth of the sections where it has been cultivated. The aggregate area devoted to rice now approximates 100,000 acres, and the yield has proved satisfactory wherever proper attention has been given the cultivation and care of the crop. There are many thousands of acres in the State that can be devoted to this crop with profit, and Arkansas will no doubt become in the near future one of the important rice-producing States.

Arkansas was the latest among the Southern States to demonstrate the capabilities of the upland prairie lands in rice-growing. In 1899 the State raised less than 200 bushels of rice, an amount hardly to be considered in the total crop of 5,500,000 bushels that year in the country. About 1902 experiments were made in raising the cereal on the prairies in the eastern part of the State, where lands were bringing from \$1 to \$5 an acre, and where now such lands bring from \$35 to \$50 and even more an acre. Since then, under irrigation, rice-growing has expanded in the State to a crop in 1912 of 3,405,000 bushels, raised upon 90,000 acres and bringing \$3,201,000. The average yield per acre in that year was 37.5 bushels, a greater average than that of any other Southern State. It is no wonder that rice-growing land has risen in value and that the expansion of farming operations in portions of Eastern Arkansas, consequent upon the notable increase in rice cultivation, has been accompanied by other material advancement in that section, illustrated in the establishment at strategic points of a number of rice mills, representing an investment of between \$900,000 and \$1,000,000, and in the investment of many other millions of dollars in provisions for the irrigation of the prairie lands by means of pumping wells.

The livestock industry is now being given much attention, the mild climate and numerous grass and forage crops making conditions almost ideal for producing beef at low cost. The breed of cattle is being rapidly improved, and the best farmers are adopting the practice of having each year a number of beef cattle for sale. Feeding stock on the farm is becoming a popular way to make ready money and at the same time build up the soil. Horses and mules are being raised to a much greater extent than a few years ago, when work stock was largely purchased from other States. Hogs can be raised at low cost, owing to the fact that green food abounds throughout practically the entire year, and that the hog can "rustle" for himself and needs no feeding.

Trucking is a profitable occupation in numerous sections, and large truck farms have been established. Vegetables grown for market are shipped by

the hundreds of carloads each year, and the truck farmer has become among the State's most prosperous citizens. Peas, beans, onions, radishes, cabbage, cauliflower, early Irish potatoes, sweet potatoes, lettuce, beets, asparagus—in short all the popular vegetables—are grown in abundance and sent to Northern markets at a time when they command good prices. Strawberries are largely grown also, the shipments reaching hundreds of carloads each year. Other small fruits are produced in large quantities.

Numerous sections of Arkansas are well adapted to orcharding, and for a number of years apple growing has been the most profitable industry in the Ozark country, in the north central and northwest portions of the State. The highlands of those sections are peculiarly adapted to the growth and ripening of the best quality of this most used of fruits, the size, coloring and flavor being of the highest excellence. Arkansas apples have taken many first prizes in competition with apples from all other States. Peaches grow in practically all sections, and the State ships thousands of carloads annually to the markets elsewhere. The Elberta, Carmen, Red Bird, Wheeler, Mamie Ross—in fact, all the popular varieties, are grown. Pears produce well, but have not been grown commercially to any considerable extent. Plums also produce well where cultivated and cared for. Arkansas grapes are widely known for size and excellence of flavor, and there are a few large vineyards in the State.

Of recent years Arkansas has been becoming more and more a manufacturing State. The capital thus engaged was \$2,953,000 in 1880; it increased to \$14,972,000 in 1890, to \$35,961,000 in 1900, and to \$70,139,000 in 1909. The manufactured products increased in value during the same period from \$6,756,000 in 1880 to \$92,000,000 in 1912. Of these manufactured products, lumber and the output of the various plants using lumber form the largest part. These include furniture and chair-making plants, wagon factories, planing mills and mills making general inside finish. Other important branches are cotton goods, cottonseed products, rice mills and flouring mills. Development of natural gas will add much to the manufacturing strength of the State.

The development of the public school system in Arkansas during the past decade has been very rapid. In 1880 the State expended upon common schools \$287,000, which by 1900 had increased to \$1,369,000 and in 1909 to \$3,110,000, a remarkable increase. In salaries of teachers, in length of school term and in general efficiency the advance has been no less marked. The system comprehends, primary schools, grammar schools, high schools, normal schools for training of teachers, a State university, four agricultural colleges and schools for the blind and the deaf-mutes.

Arkansas is rich in mineral resources, but as yet their extent and value have never been fully understood, even by the people of the State, as there has been no adequate geological investigation and exploitation of them. The interests of the State have largely been centered upon the abounding agricultural opportunities offered, while the industrial potentialities, the mineral wealth and the water-powers available for development have not yet received the attention their extent justifies. The State, however, is awakening to its wealth-creating resources, and a much more rapid industrial growth may be looked for in the near future.

### ARKANSAS SUMMARIZED STATISTICALLY.

Land Area, 52,525 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	802,525	1,128,211	1,311,564	*1,624,000
Manufactures: ‡				
Capital .....	\$2,953,000	\$14,972,000	\$35,961,000	†\$70,174,000
Products—value .....	\$6,756,000	\$22,659,000	\$45,198,000	†\$74,916,000
Cotton Mills:				
Spindles active.....	2,015	5,780	9,700	7,090
Looms active.....	28	70	257	164
Cotton used, pounds.....	340,000	936,360	2,034,273	4,554,264
Cottonseed Oil Mills:				
Products .....	\$590,000	\$1,881,668	\$3,188,812	†\$7,700,000
Lumber cut, feet.....	172,503,000	526,091,000	1,595,933,000	†1,777,303,000
Improved farm lands, acres.....	3,595,603	5,475,043	6,953,735	\$8,062,000
Farm lands, buildings, value.....	\$74,249,655	\$118,574,422	\$135,182,170	\$8308,129,000
Agricultural products, value.....	\$43,796,000	\$53,128,000	\$79,649,000	*\$168,375,000
Cotton crop, running bales.....	608,256	691,494	711,739	*846,000
Grain, bushels:				
Corn .....	32,350,000	33,443,000	45,226,000	52,163,000
Wheat .....	1,356,000	1,575,000	2,689,000	940,000
Oats .....	2,749,000	3,967,000	7,039,000	3,463,000
Livestock:				
Cattle .....	682,000	938,244	895,000	942,000
Sheep .....	247,000	243,999	257,000	134,000
Swine .....	1,565,000	1,505,214	1,713,000	1,738,000
Mineral products, value.....	\$65,535	\$1,130,226	\$2,383,500	*\$5,600,000
Coal mined, tons.....	14,778	399,888	1,447,945	*2,500,000
Railroad mileage.....	859	2,203	3,109	5,230
National Banks:				
Resources .....	\$779,491	\$5,526,862	\$5,244,680	\$36,997,603
Capital .....	\$205,000	\$1,530,310	\$1,070,000	\$5,035,000
Individual deposits.....	\$265,382	\$2,235,091	\$3,102,315	\$18,785,149
Other banks, deposits.....	\$577,628	\$1,107,743	\$4,597,891	\$32,106,521
Common school expenditures.....	\$287,056	\$1,016,776	\$1,369,810	\$83,187,000
Property, true value.....	\$286,000,000	\$455,147,000	\$604,200,000	*\$971,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910.

FLORIDA

THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
Factories...	\$5,546,000	\$18,223,000	\$36,810,000	\$90,000,000
Farms.....	\$7,439,000	\$12,086,000	\$18,309,000	\$43,659,000
Forests.....	\$5,010,000	\$9,511,000	\$18,080,000	\$34,027,000
Mines.....	\$1,500	\$465,000	\$2,327,000	\$11,000,000

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



FLORIDA, formed something like a boot, with the heel and sole marking the southern boundary of Georgia and most of Alabama, and the leg extending far down into the Southern seas, washed by the Atlantic on the east and the Gulf of Mexico on the west, furnishes the southernmost reach of the United States. Its total length from north to south is approximately 500 miles, and its greatest width from east to west 320 miles. Its area is 54,861 square miles of land and 3805 of water, making it the largest Southern State east of the Mississippi River, except Georgia, which passes it by less than 1000 square miles.

The total stretch of Florida's coast line is 1273 miles, more by 300 miles than that of California, and more by many miles than that of any other State. It has 1175 miles of navigable rivers, principal among which are the St. Johns, Indian, Kissimmee, Apalachicola, Suwanee and St. Marys. A peculiarity of the St. Johns River is that it flows throughout almost its entire length practically due north, turning almost at right angles to the east, near Jacksonville, and flowing in that direction some 35 miles to the ocean. It is the only river in the country flowing so nearly due north for so great a distance. It is navigable for ocean-going steamers to Jacksonville, where it furnishes fine harborage, and for lighter draft vessels many miles above. In addition to its rivers, Florida has many miles of bays, lakes and lagoons that are navigable, and in some cases these are being joined together by channels that create an inland canal reaching up and down the State for many miles.

Florida has hundreds of lakes—indeed, the number is said to run into thousands—of which Okeechobee is the largest, being the greatest body of fresh water lying wholly within the United States, except Lake Michigan. Its area is about 500 square miles. From Okeechobee the lakes vary in size down to mere ponds of very few acres each. Many of them are of great beauty, of large size and liberally stocked with fish. There are myriad springs also, of which Tarpon Springs on the west coast, and Silver Spring in Marion county, are among those of a most striking character. Tarpon Springs has been sounded to a depth of 900 feet without finding bottom. Silver Spring is a bold, strong stream of water of such perfect clearness that at a depth of 75 to 80 feet a 25-cent silver piece could be easily seen. It is annually visited by thousands of tourists, many of them from abroad. Some of the springs possess medicinal properties that draw many visitors during the year. Water may also be found a few feet below the surface throughout a large part of the State, and many driven and bored wells have been put down, from which abundant supplies are secured for irrigation purposes. In some sections there is such strong pressure that the water gushes from the wells with much force, and in places it is utilized for the development of considerable power.

The surface of the land rises from a few feet above the sea level on the coast to 300 feet elevation in the central portion and some parts of the western section, and its geographical location, from 24° 30' to 31° north latitude, gives it a semi-tropical climate. The lower part of the State, some 300 miles in length and embracing about 34,000 square miles, forms a peninsula that divides the waters of the Atlantic from those of the Gulf of Mexico. This peninsula consists for the most part of lowlands, though it takes in some of the higher ground on the western coast. It embraces the Everglades, of which there are approximately 4,000,000 acres, and most of the swamp lands of the State, of which there is a large area. The Everglades, which are like a large submerged prairie, are being drained by the State.

That portion of the State lying above the peninsula, stretching 320 miles from east to west, contains 24,000 square miles. Much of this area is of the uplands variety, some of it taking in the State's highest elevation, about 300 feet. It is a fine fruit growing, trucking and general farming section.

The soils of Florida are, generally speaking, first, second and third class pine lands, high hammock, low hammock and swamp lands. The first-class pine lands are covered usually with a dark vegetable mold, beneath which for several feet is a chocolate-colored sandy loam, mixed with pebbles and resting upon a substratum of marl clay or lime rock. These lands are seemingly inexhaustible in productive power, and are adapted to the growing of fruits, vegetables and cotton, producing the high-priced sea island cotton prolifically. The second-class pine lands, which cover a larger portion of the State than any other, are practically all productive. They are usually of an undulating surface, in some places rising to the dignity of hills. The soil is lighter than that of the first-class lands, but the sub-soil is the same, the clay

being somewhat deeper down. They are used for practically all kinds of agricultural purposes, and while they do not last as long as those first described, their fertility can be easily restored by the use of fertilizers. The third-class pine lands run from high, rolling surfaces to low swampy regions. They are less valuable than the others, but by no means worthless, as besides furnishing excellent pasturage, they produce well of various articles of agriculture. The high hammock lands are those in greatest favor for general purposes. The soil is formed of a fine vegetable mold, mixed with sandy loam, many feet deep in places, and resting upon a substratum of clay, marl and limestone. They are easily cultivated from the first, and require little fertilization to make them yield abundantly of almost any crop. The low hammock lands are of rich, deep soil; they usually require ditching. They are especially adapted to the production of corn, sugar cane, cotton and the truck crops. The swamp lands are alluvial in character, occupying natural depressions into which have washed the vegetable debris from the higher lands surrounding. They produce abundantly of any kind of crop grown in that latitude. They have been known to produce cane from which 5000 pounds of sugar or 600 gallons of syrup have been made to the acre. The soil of the Everglades is of this character, and owing to their vast extent and the general interest they elicit, and no less to the fact that their drainage is the most extensive piece of work of the kind ever undertaken in this country, it is considered not amiss to devote to them somewhat more extended space.

The Everglades cover an area of about 6000 square miles, being half or more of that portion of the State lying south of Lake Okeechobee. Upon a coralline limestone base lies an immense accumulation of sand, which is covered in turn by alluvial deposits and decayed vegetable matter to a depth running from 2 to 20 feet. This surface is covered by a sheet of water of varying depth, owing to the conformation of the bottom, but seldom in the dry season being more than three feet. The whole surface is covered with a rank growth of coarse grass having edges like a saw, from which it takes the name of "saw-grass." Numerous channels, few of them of much depth, wind tortuously through this submerged plain, and here and there are lakes and ponds in which fish of various kinds abound. Numerous hammocks also rise above the surface like islands from the sea, and some of these are covered with vegetation of various kinds. The soil of these hammocks is very rich, and many of them have been cultivated from time to time by scattered bands of Seminole Indians, who make the Everglades their home. There are no rocks or stumps in the Everglades, and the agriculturist who undertakes the cultivation of any portion of them, after the work of drainage has been done, needs but to cut and burn the saw-grass before starting the plow. Sugar cane, cotton, Irish potatoes, sweet potatoes, celery, tomatoes, cabbage, beets, onions, turnips, peppers, eggplant—all the crops not requiring a colder climate grow well in the black muck of the Everglades. The drainage of this immense section will be accomplished by digging a number of wide and deep canals from Lake Okeechobee to the ocean on the one side and the gulf on the other, with many lateral canals and farm ditches. The big canals are being dug by the State, and it is expected that they will be completed by July of the present year.

Florida is pre-eminently a citrus fruit-growing State, its oranges and grapefruit having a flavor unknown to the fruits of the Pacific Coast. It also yields large quantities of other fruits grown in a semi-tropical climate. Its production of oranges and grapefruit for the year 1912 is estimated at from 7,000,000 to 8,000,000 boxes. It has a practical monopoly of the grapefruit business, for that popular fruit, which is yearly meeting with increased demand, has not been brought to such perfection anywhere else in this country. The largest grapefruit grove, so it is claimed, in the world is in Florida. That State produces the pineapple, sappadillo, citron, banana, cocoanut, date-palm, guava, sugar-apple, pomegranate, alligator pear, kumquat, fig, peach, plum, pear, and grapes of many varieties grow in the greatest profusion. Many orange and grapefruit orchards are being put out each year, and the importance of the State in the business of fruit growing is rapidly increasing.

Truck growing has also become an important business, and those who have carried it on with industry and intelligence have found it profitable. It is one of the most rapidly growing industries of the State. The shipment of tomatoes alone reaches several million dollars in value annually, one county shipping a million and a half dollars' worth. The truck crops grown for the market



cover every variety of vegetable known to the semi-tropic climate. Water-melons, canteloupes and strawberries are also grown in large quantities. In some places the truckers are specializing in celery, which is found a very profitable crop, and Florida celery is now shipped North and West annually by hundreds of carloads. So prolific is the yield that it is a matter of record that one acre of celery sometimes yields as much as \$1500 a year to the railroads for freight, including the icing.

Of late more attention is being paid to the growing of grains and grasses and forage crops. Corn yields well in most parts of the State, and is being cultivated much more than formerly. It is possible in Florida to raise two or three crops each season on the same land, thus giving farmers opportunities for money making unknown to Western farmers. Cowpeas, Soy beans, Bermuda onions are being raised in ever-increasing quantity; grasses are being cultivated and forage is being cared for, whereas, a few years ago stock was allowed to run at large and live as it could. Dairying is receiving a good deal of attention in a number of places, and the returns from it have been found satisfactory. High-grade tobacco is produced in some of the Northern counties.

There is much timber, and the lumber business is one of leading importance. Many sawmills are working in various sections, and there are several large plants for the manufacture of barrels, boxes and crates for use in shipping fruits and vegetables. Large quantities of naval stores are gathered, and turpentine camps are to be seen in every part of the State. The cigar industry at Key West and Tampa employs millions of capital and thousands of operatives, most of the latter being foreigners. The daily output at Tampa is about 1,000,000 cigars.

The State is the largest producer of phosphate rock in the country. Immense deposits are found in several counties, and its mining and shipping give employment to many men. In 1911 the amount shipped from the State was 2,494,572 long tons. Much of it was exported. Florida rock is the basis of much of the fertilizer industry of Europe, as well as of this country. Enormous plants equipped with the most modern machinery are in operation in the phosphate districts. The shipment of this rock to foreign and American ports has created a very large business at a number of Florida ports, at which phosphate elevators have been built for storing and handling the rock and putting it on shipboard.

Peat is found in many places. It has not been much utilized for fuel as yet, though it is being used for that purpose in at least one place, and one plant is using it as a filler for fertilizer. Experiments have shown it to be of great value as a producer of power when used in gas producer machines, a fact that opens up possibilities in a number of lines of manufacture.

The waters abound in fish of many kinds, and the fishing industry is an important one in numerous communities. Thousands of tons of fish are shipped each year to Northern markets. Catching and shipping green turtles is an important industry at Key West. Sponge fishing, formerly confined mainly to the Key West section, is now a leading industry at Tarpon Springs, where there is a colony of about 2000 Greek sponge fishers who have been attracted from the Mediterranean sponge industry by the larger opportunities found at Tarpon Springs.

Throughout various portions of the State herds of cattle run at large through the woods and swamps and upon the prairies, thriving on the pasturage in a manner quite satisfactory to their owners. These cattle are not large, but latterly the stock is being improved by the introduction of better breeds, and the average size is being raised. With improved breeding and im-

proved methods in handling it, the stock-raising business in Florida will doubtless become one of great importance, for grass and hay crops can be cheaply produced, and stock can thrive outdoors the year around.

From Fernandina to Pensacola the two coasts of Florida offer a succession of harbors. Each of these has its particular merit that has influence in building up the city situated upon it and the country lying about. Ships leaving these harbors sail for many ports, thus giving Florida direct connection with centers of business throughout the world.

A number of trunk lines of railroad enter Florida from the North, giving most of the important cities of the State connection with the country's principal markets. The Seaboard Air Line and the Atlantic Coast Line traverse much of the State, and the Louisville and Nashville runs across a portion of the upper part from east to west. The Florida East Coast Railway runs along the entire ocean front, from Jacksonville to Key West. The southern portion of this road, passing from key to key for 100 miles from the mainland to Key West, constitutes one of the greatest feats of railroad construction ever accomplished, and doubtless the largest and most striking business achievement ever wrought by a single man by his own capital. In places it passes, by a succession of reinforced concrete arches, or long lines of steel girder or cantilever bridges, over miles of open water. The longest of these stretches is almost seven miles. At some points the traveler is carried entirely out of sight of land. There are numerous shorter lines of road in the State, reaching into nearly every section.

The population of Florida increased between 1900 and 1910 over 42 per cent., a much larger gain than that of any other State east of the Rocky Mountains, except Oklahoma.

The climate of Florida is greatly influenced by the Atlantic Ocean and the Gulf of Mexico. Extremes of heat or cold are very rare, the temperature seldom falling below 32 or rising above 90.

Many of the counties are carrying on comprehensive plans of road building that in time will make the State a network of improved highways, over which the farmer can easily and cheaply haul his products to the railroad, or the visitor can speed his automobile in comfort and safety.

With its semi-tropical vegetation appealing greatly to every visitor, its unusual climatic advantages, for the Florida climate is an asset as tangible as the coal and iron of Alabama are to that State, it is drawing an ever-increasing number of winter tourists, some seeking its balmy air for health, some to escape the rigors of Northern and Western winters, some merely for the pleasure of outdoor life that they may enjoy the summer climate throughout the winter season. Thousands of people of wealth are making their winter homes in Florida. Thousands of moderate means are locating in that State as a permanent home, with a view to making a living in a region of such great advantages. Thousands of others are moving there because of the harshness of the winters in Northern latitudes. During the winter, Florida railroads and hotels are taxed to their utmost capacity to care for visitors; and yet any one who investigates the subject will soon see that the movement has only begun. Many people who have tried California have turned to Florida as offering better climatic and business advantages; and what California has been to the development of the Pacific Coast, Florida is to be to the Eastern States. It is destined to be one of the most prosperous sections of the Union, the home of millions of contented people, a great winter resort and playground of tens of thousands who can afford to spend their winters away from business and the harshness of other climates. Florida is in the infancy of its development.

### FLORIDA SUMMARIZED STATISTICALLY.

Land Area, 54,861 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	269,493	391,422	528,542	*794,000
Manufactures: ‡				
Capital .....	\$3,211,000	\$11,110,000	\$33,107,000	†\$65,291,000
Products—value .....	\$5,546,000	\$18,223,000	\$36,810,000	†\$72,890,000
Cotton Mills:				
Spindles active .....	816	.....	.....	.....
Cotton used, pounds .....	166,250	.....	.....	.....
Cottonseed Oil Mills:				
Products, value .....	.....	.....	.....	†\$514,000
Lumber cut, feet .....	247,627,000	411,436,000	788,905,000	†\$983,824,000
Improved farm lands, acres .....	947,640	1,145,693	1,511,653	\$1,803,000
Farm lands, buildings, value .....	\$20,291,835	\$72,745,180	\$40,799,838	§\$117,623,000
Agricultural products, value .....	\$7,439,000	\$12,086,000	\$18,309,000	*\$43,659,000
Cotton crop, running bales .....	54,997	57,928	56,875	*61,000
Grain, bushels:				
Corn .....	3,522,000	4,570,000	4,156,000	8,064,000
Oats .....	436,000	573,000	378,000	740,000
Livestock:				
Cattle .....	451,000	465,881	751,000	981,000
Sheep .....	106,000	98,275	125,000	120,000
Swine .....	287,000	374,241	464,000	954,000
Mineral products, value .....	\$1,500	\$464,706	\$3,326,517	*\$11,000,000
Phosphate, tons .....	.....	46,501	706,243	*2,789,000
Railroad mileage .....	518	2,490	3,256	5,107
National Banks:				
Resources .....	\$312,335	\$5,603,848	\$9,642,703	\$58,005,178
Capital .....	\$100,000	\$1,150,000	\$1,155,000	\$7,245,000
Individual deposits .....	\$157,203	\$3,363,953	\$6,435,411	\$32,035,316
Other banks, deposits .....	\$287,289	\$852,739	\$3,714,831	\$28,683,450
Common school expenditures .....	\$114,895	\$516,533	\$765,777	\$81,774,000
Property, true value .....	\$120,000,000	\$389,489,000	\$355,700,000	*\$625,000,000

\*Partly estimated. †Not including neighborhood industries and hand trades in 1909. ‡Figures of 1909. §Figures of 1911. §Figures of 1910.

GEORGIA

THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
Factories . . .	\$36,441,000	\$68,917,000	\$106,655,000	\$245,000,000
Farms . . . . .	\$67,029,000	\$83,371,000	\$104,304,000	\$269,220,000
Forests . . . .	\$8,125,000	\$17,978,000	\$22,841,000	\$35,632,000
Mines . . . . .	\$703,000	\$2,818,000	\$3,448,000	\$6,000,000

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 33.



GEORGIA, largest of the States east of the Mississippi, has 59,265 square miles, of which water covers 540. It lies between 30° 21' and 35° north latitude, and between 3° 47' 21" and 8° 42' longitude west from Washington. Its climate varies from that of Florida as far south as Jacksonville to the mountain region of Tennessee about Chattanooga. Across the northern end of the State are mountains, the Blue Ridge chain in the east and Sand and Lookout mountains in the western corner, rising to high altitudes above the broad, rich valleys lying between. Chattahoochee ridge, an offshoot from the Blue Ridge chain, running south of the Chattahoochee River, forms the divide between the Atlantic and Gulf watersheds, but loses its mountainous character and sinks to a broad plateau-like eminence as it runs south, and spreads out to a rolling, plain-like surface as it nears Atlanta. The general contour of the State is mountainous on the north, with the higher elevations breaking rapidly down into rolling plateau lands in the Piedmont region, and these sloping more slowly into the low, level reaches of the coast country and the southern border. The average temperature is 65 degrees Fahrenheit, and for its 320-mile reach north and south its elevation rises from sea level to 5000 feet. The average rainfall is 46 to 50 inches. The coast region has a mean winter temperature of 48 degrees, and rarely goes below 32 degrees.

The soils of Georgia are of many kinds, from the muck of the swamps and the alluvia of the river bottoms through the various loams and clays to unproductive sands. The products are alike varied, and combine every kind of grain, vegetable and fruit grown in any part of the United States, from rice to wheat, from plantains to winter potatoes, and from oranges to apples. The contour of the country as it falls from mountain to plateau and from plateau to pine flats and from pine flats to lowlands, and the many streams that take their rise in the higher sections and flow through the various levels to the sea present many opportunities for the development of water-power. A number of hydro-electric companies are operating in the State, the aggregate power now utilized being several hundred thousand horse-power, while several companies are at work developing other powers. Very large developments have been made around Columbus, Macon, Atlanta, Augusta and other points, furnishing electric power to these cities and the surrounding country. One company, capitalized at \$57,000,000, in which English and Canadian investors are largely interested, controls an aggregate of about 300,000 to 400,000 of developed and undeveloped power. Its largest single power plant is at Tallulah Falls, where about 90,000 horse-power will be generated. This company, which controls the street railway system of Atlanta, will ultimately extend lines through some of the surrounding country until they connect up many of the more important towns and cities throughout Piedmont and North Georgia. Other companies operating in the sections tributary to Columbus, Macon and Augusta, represent many millions of dollars of capital invested or being expended in hydro-electric work.

There are few, if any, lines of agriculture which are not engaged in to some extent in Georgia, for the varied soil and climate permit the cultivation of nearly every crop of the temperate zone. Of recent years there has been a wide dissemination of agricultural knowledge among the people, and the consequence is a better average of farming, larger yields per acre, and a great impulse in the agricultural life of the State. Georgia has well established agricultural schools and demonstration farms. The railroads have adopted the plan of running demonstration trains through the agricultural sections penetrated by their lines, and a general awakening in the minds of the people to the necessity of better methods has been brought about. Diversification of crops, the enlarged use of fertilizers, the growing of home supplies on the farm, orcharding, stock-raising and dairying as part of the general farm scheme, all these things have been taught and are being practiced throughout the State.

Of the crops raised in Georgia cotton is the most important. This State stands second to Texas in the production of that staple. The average product of cotton throughout the State is from one-half to four-tenths of a bale per acre, while lands properly fertilized and carefully cultivated frequently produce a bale or more to the acre. In 1912, on a 17,000-acre farm of cutover pine land, a large portion of which is now being farmed in the most scientific way, 2700 bales of cotton were produced on 2500 acres. While a larger yield per acre has often been made in different parts of the South on small tracts, it is

believed by some authorities that this is the largest aggregate yield of over one bale per acre ever made by any cotton grower in the South.

Corn, wheat, oats—all the principal grains—yield well in Georgia. Corn is produced in all sections, while wheat is better adapted to the middle and the northern portions of the State. In Floyd county, in the northwestern portion, and in adjoining counties, fine crops of wheat are made. Oats have on well cultivated land yielded from 30 to 50 bushels, though this, of course, is above the average of the State. Rye and barley also produce well in various sections. Rice is grown along the seaboard, where a large acreage is well adapted to its production. Both the lowland and upland varieties of rice are planted.

An unusual number of the grasses and forage crops are found in Georgia, making it an excellent location for stock-raising. Among the varieties most common and most useful for hay and forage are Bermuda grass, orchard grass, crab grass, Heard's grass, the clovers, lespedeza, alfalfa, millet, vetch, soy beans, cow peas, and such crops as sorghum, peanuts and chufas. Timothy makes a good crop in some of the northern counties, and blue grass is grown in some sections. One advantage Georgia enjoys with the other Southern States is that three or four crops of hay may be made on the land in one year. In many portions of Southern Georgia, as well as in some of the other Southern States, two different crops are usually raised on the same land each year.

Sugar cane for making syrup is a standard crop in some sections of the State, and from 600 to 800 gallons of syrup have been produced per acre. In a number of places tobacco is grown, and in 1910 the average return per acre was \$147 on the Georgia crop. Buckwheat and broom corn are grown in numerous localities, but only to a limited extent anywhere, though both produce well. Peanuts are prolific producers and are grown in many sections. Irish potatoes and sweet potatoes produce abundantly, and the crops of each frequently run as high in value as \$150 to \$200 an acre.

Georgia has become famous for watermelons, and the shipments run over several thousand carloads a year. They grow in practically every part of the State, but the principal districts in which they are grown largely for shipment are in South Georgia. They attain great size and are of fine flavor, making them popular in all the markets of the country. They often make a most profitable crop for the grower. The growing of canteloupes has become a prominent part of husbandry in some portions of the State, notably in the southwestern section, about Albany. Unusually fine ones are raised there, and many carloads are sent to the Northern markets at a time when they command high prices.

The Georgia peach is no less well and favorably known in the country's markets than the Georgia watermelon, and the peach-growing industry is one of great importance to the State. It is estimated that there are now in Georgia something like 18,000,000 peach trees. The bulk of the peach business is in the counties southwest of the central portion, the greatest shipping points being Fort Valley and Marshallville. During the last season one railroad alone carried 5334 carloads of peaches out of the State. Plums, pears and other fruit are also raised to a considerable extent. On the lowlands lying along the coast oranges and other citrus fruits are grown, together with great quantities of figs. Apples have been grown commercially in the northern counties for the past few years, and the promise is good for a large increase in that branch of orcharding. In the upper Piedmont and mountain sections apple-growing is making rapid progress.

The soils in numerous sections have been found of the highest virtue in the production of truck crops, and this, combined with the early seasons of the coast section, has caused a large and lucrative truck-growing business to be built up in a number of communities. Tomatoes, beans, peas, cabbage, lettuce, onions, cauliflower, early potatoes, both Irish and sweet; early corn and various other vegetables are produced in large quantities, and owing to the excellent transportation facilities furnished by the railroad lines are put into the markets of the Northern and Western cities fresh and crisp and in condition to command the highest prices. In North Georgia also vegetables of all kinds yield prolifically.

With improved agricultural conditions generally have come improved methods in stock-raising and improvement in the stock raised. The many nutritious grasses and forage crops that grow throughout the State in such exuberance, and the mild climate that permits stock to graze through practically all of every winter, make ideal conditions for profit in the growing of



cattle, hogs, horses and mules. Dairy products are now being furnished to a large extent from Georgia farms.

Pecan growing is becoming an important part of the productive life of Georgia, and especially in the southwestern part many orchards are being set to the best varieties of that popular nut. The industry has proven very profitable and is being vigorously developed, giving promise of becoming a source of much wealth to the State.

A large portion of Georgia is yet covered with forests, in which stand hundreds of millions of feet of timber that produces the best quality of lumber. In the coast regions is much pine, the swamps are full of cypress and gum, and on the uplands and in the mountains are the oaks, poplar, chestnut, ash, elm, hickory, walnut and other hardwoods. Hundreds of mills, from the most modern band-saw type to the old-style "portable," are engaged in turning the timber into lumber, and the output runs well over a billion feet a year. There is also a very considerable development being made in furniture and wagon-making and kindred interests.

The State is rich in mineral deposits, both as to variety and as to quantity in which many of them are found. It has marbles of the highest rank for building purposes and practically of unlimited extent, fine granites in equal abundance, a granite mountain near Atlanta being classed as one of the greatest granite beds known in the world; kaolins for making the highest class pottery, and clays for the manufacture of all kinds of brick, tile and sewer pipe. It has limestone and shales needed for making high-class Portland cement. Red and brown iron ores are found in a number of the counties. There is a coal area of 167 square miles, largely in the northwestern section, where an excellent grade of steam and coking coal is found. Bauxite exists in large quantities; it is mined extensively for use in the aluminum plants at Pittsburgh and at Niagara Falls. There are important gold deposits in a number of counties, and mining has been carried on for almost a hundred years. The first gold coins issued by the United States, in 1829, were from Georgia metal. In 1838 a branch of the United States mint was established at Dahlonega and coined \$6,000,000 up to 1860. Gold mining is still being carried on in these counties. Other valuable minerals found in the State are asbestos, corundum, talc, graphite, barytes, copper and others. Phosphate rock is found in South Georgia.

The industrial development of Georgia has made rapid progress and covers a very wide range of diversified manufacture. There is no one line of industry standing out pre-eminent as in many other States, but throughout the State there is a broad, general diversification of manufactures, including an unusually large number of separate industries. Cotton manufacturing takes the lead as the largest single industry in Georgia. The State has more than 2,000,000 spindles and 40,000 looms. Many of the mills are of exceptional size, and some of them produce a very high grade of goods. One of the very large mills of the State makes high-grade cotton duck out of Sea Island and Egyptian cotton for use in the manufacture of automobile tires of the highest quality. This mill has sold as high as 1,000,000 yards of high-grade cotton duck to one tire manufacturer in one season. As in general manufacturing throughout the State, so in the cotton industry there is a wide diversification of products. The State has an unusually wide range of raw materials for manufactures, in-

cluding cotton, lumber, iron, clays for brick and tile work, as well as kaolin for high-grade pottery work. Georgia, however, has not depended upon its own resources exclusively, but has drawn from surrounding States raw materials for manufacturing; thus taking pig-iron, for instance, from Birmingham and utilizing it in the manufacture of steel, engines, boilers, ice and refrigerating machinery, and many other products. It has drawn phosphate rock from Florida and other fertilizer ingredients from the West, and in connection with local materials has developed a very large fertilizer industry. In a well-rounded industrial life there is probably no other State in the Union that has laid a better foundation for continued expansion. The rapidity of its industrial development is illustrated in the fact that the value of its factory products increased from \$106,655,000 in 1900 to \$245,000,000 in 1912.

The progress of the banking interests of the State are indicative of the general progress and prosperity of Georgia. The total national banking resources of Georgia rose from \$23,500,000 in 1900 to \$102,684,000 in 1912. During the same time individual deposits in national banks advanced from \$10,800,000 to \$46,800,000, while deposits in other banks, including State, savings and trust companies, rose from \$22,200,000 to \$75,000,000.

The leading coast cities of Georgia are Savannah, Brunswick and St. Marys, the latter having developed an export trade, mainly in lumber, of considerable extent. Savannah exported in 1912 more than \$104,000,000 worth of merchandise, in addition to which it has a very large coastwise trade, many steamers plying constantly between that port and the leading ports of the North Atlantic. The value of the exports from Savannah were in 1912 more than twice as great as the total value of exports from San Francisco, and \$26,000,000 larger than the combined exports of all the United States Pacific ports, excepting San Francisco. The exports from Brunswick exceed in value by \$5,000,000 the exports from all these Pacific ports, except San Francisco and Puget Sound.

Georgia has 7500 miles of railroad. Within the last few years the facilities of the railroads of the State have been fully taxed by the growing traffic, and large improvements are under way for the increase of railroad facilities, the betterment of existing lines by double tracking and better grades. Notwithstanding these improvements, however, the growth of the State promises to be so rapid as to necessitate a very great increase in railroad mileage and in double tracking.

Georgia has a thorough public school system, at the head of which stands a university of high class, supplemented by a school of technology of unusual promise, and reinforced by scores of high schools and thousands of those of lesser grade throughout the State. There are also many denominational schools and private institutions doing splendid educational work, and some of them ranking among the best in the country. The expenditures for the maintenance of common schools now considerably exceed \$4,000,000 a year.

Convicts working on the roads, hundreds of miles of splendid roads have been constructed. Few States in the Union are giving greater attention to this matter.

Georgia has great resources in soil, climate, water-powers, timbers, granites, marbles, clays and other resources, offering an almost unlimited field for industrial and agricultural expansion.

### GEORGIA SUMMARIZED STATISTICALLY.

Land Area, 58,725 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,542,180	1,837,353	2,216,331	*2,685,000
Manufactures: ‡				
Capital .....	\$20,672,000	\$56,922,000	\$89,790,000	†\$202,778,000
Products—value .....	\$36,441,000	\$68,917,000	\$106,655,000	†\$202,863,000
Cotton Mills:				
Spindles active .....	198,656	445,452	815,545	1,956,894
Looms active .....	4,493	10,459	19,398	39,842
Cotton used, pounds .....	33,757,199	69,139,410	145,833,115	278,894,317
Cottonseed Oil Mills:				
Products, value .....		\$1,670,196	\$8,064,112	†\$17,084,000
Pig-iron made, tons .....	24,394	29,184	67,033	**35,000
Coke made, tons .....	38,041	102,233	73,928	*43,000
Lumber cut, feet .....	451,788,000	572,970,000	1,308,610,000	†801,611,000
Improved farm lands, acres .....	8,204,720	9,582,866	10,615,644	\$12,264,000
Farm lands, buildings, value .....	\$111,910,540	\$152,006,230	\$183,370,120	\$847,603,000
Agricultural products, value .....	\$67,029,000	\$83,371,000	\$104,304,000	*\$269,220,000
Cotton crop, running bales .....	814,441	1,191,846	1,300,184	*1,880,000
Grain, bushels:				
Corn .....	21,939,000	31,306,000	34,119,000	54,510,000
Wheat .....	3,056,000	1,411,000	5,011,000	1,256,000
Oats .....	6,185,000	5,455,000	7,010,000	7,571,000
Livestock:				
Cattle .....	860,000	824,818	899,000	1,073,000
Sheep .....	527,000	440,459	336,000	174,000
Swine .....	1,471,000	1,396,362	1,424,000	2,098,000
Mineral products, value .....	\$703,078	\$2,817,706	\$3,448,233	*\$6,000,000
Coal mined, tons .....	154,644	228,337	315,557	*170,000
Iron ore mined, tons .....	24,394	244,088	336,186	*233,000
Railroad mileage .....	2,459	4,601	5,730	7,442
National Banks:				
Resources .....	\$7,849,727	\$15,985,846	\$23,563,136	\$102,684,216
Capital .....	\$2,221,000	\$3,906,000	\$4,306,000	\$14,945,000
Individual deposits .....	\$2,012,457	\$6,334,808	\$10,864,848	\$47,821,518
Other banks, deposits .....	\$5,910,827	\$14,205,711	\$22,260,235	\$75,036,502
Common school expenditures .....	\$471,029	\$1,190,354	\$1,980,016	\$84,420,000
Property, true value .....	\$606,000,000	\$852,409,000	\$936,000,000	*\$1,590,000,000

\*Partly estimated. †Not including neighborhood industries and hand trades in 1909. ‡Figures of 1909. †Figures of 1911. §Figures of 1910. \*\*Including Missouri and North Carolina.

# KENTUCKY

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	<b>\$75,483,000</b>	<b>\$126,720,000</b>	<b>\$154,166,000</b>	<b>\$270,000,000</b>
<b>Farms.....</b>	<b>\$63,850,000</b>	<b>\$65,948,000</b>	<b>\$123,267,000</b>	<b>\$219,073,000</b>
<b>Forests.....</b>	<b>\$6,773,000</b>	<b>\$13,123,000</b>	<b>\$22,968,000</b>	<b>\$24,856,000</b>
<b>Mines.....</b>	<b>\$1,583,000</b>	<b>\$4,316,000</b>	<b>\$7,102,000</b>	<b>\$21,600,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



KENTUCKY is a name synonymous in the minds of the people with blue grass, good horses, fine turnpike roads, highbred cattle, and the most delightful conditions of rural life. And, indeed, the reputation of the State as the possessor of these things is justified by the facts. Only it must not be supposed that they constitute all, or even the most, of Kentucky's possessions. For in its area of 40,598 square miles it has so many riches of resource that it is hard to say which among them is entitled to primacy. It has long been famous for its agriculture, and little thought is given it as a manufacturing community, yet the products of its manufacturing plants have overtaken and passed in value those of its farms, and its wealth of raw materials must, in the economy of modern life, make it still more prominent in the matter of manufactures.

Kentucky's geographical position is of great strategic importance, being as it is the border State between North and South, partaking of the climate, the soils and topographic character of the one, and yet so situated as to secure the greatest benefit from close trade relations with the other. Then, too, its northern, western, northeastern and southern boundaries are fixed by navigable streams, the Ohio, the Mississippi, the Big Sandy and the Tennessee rivers, that furnish the cheapest known transportation, while its eastern boundary comprises the rich coal fields of Southwestern Virginia and West Virginia, of the riches of which it also partakes. In addition to the rivers mentioned above—forming a boundary of more than 800 miles of navigable waters—it has other streams of greater or less navigable length, the whole reaching a total of something like 1500 miles. Chief among these, though by no means completing the list, are the Kentucky River, the Cumberland, the Green, the Licking and the Tradewater.

Kentucky is divided into three natural parts, the Mountain region, the Blue Grass and the Jackson Purchase. The Mountain region embraces about 10,000 square miles of the eastern portion of the State and furnishes much of the output of minerals that brings to the State each year millions of dollars. It is a high plateau, deeply cut by streams, and with ranges of mountains along the southeastern border, which is extremely rugged. The plateau has an average elevation of between 1000 and 1500 feet, and the mountains rise to great height above this in places. Coal measures of great thickness and of extremely high quality of product underlie practically this entire area, and there are numerous other minerals also found in it in such quantity and of such value as to offer excellent opportunities for future development. Fine forests, virgin to the axe, cover wide areas of the mountain division, the timber being of the finest hardwood varieties, of which all kinds are represented—the oaks, poplar, maple, beech, walnut, chestnut, hemlock, hickory—all the various kinds of merchantable hardwoods. In fact, this section of Kentucky lies in the great central hardwood belt, than which there are no richer timber lands in the country.

The Blue Grass region is that far-famed section of Kentucky that comes at once to the mind when mention is made of thoroughbred horses, short-horn cattle, fine mules and rich and hospitable rural homes. This section occupies the north central portion of the State and covers about 8000 square miles. It is a limestone region, whose soils have been made by a mixture of disintegrated limestone and the alluvial deposits of the ages, a combination that has no superior for general agricultural and stock-raising purposes. Blue grass springs up spontaneously in fields left uncultivated, and yields heavily and permanently of that choice of grazing grasses. The soils also yield abundantly of corn, wheat, tobacco, hay and of fruits and vegetables of all kinds known to the temperate zone. The Blue Grass region is noted also for the excellence of its country roads, miles of smooth, well-graded, macadam-surfaced highways that make driving a pleasure, and render country life attractive as only good roads can.

The Jackson Purchase is that portion of the State lying between the Mississippi and Tennessee rivers, rich in farm potentialities. It is a level, fertile body of land, with deep alluvial soils, and is unsurpassed for the production of grain, tobacco, hay and truck crops. The southwestern part of the Jackson Purchase lies within the cotton belt, and some of the farmers have raised that staple with profit, but it is not planted to any very considerable extent. Trucking is engaged in to a large extent and with satisfactory results.

Kentucky has long been one of the leading States in agriculture, both with respect to the value of the output and the wide range of products. Corn is the chief among these, and is followed by tobacco, hay and forage, wheat, potatoes and oats in the order named, the aggregate value of these for 1910 being about \$155,000,000. In the production of tobacco, Kentucky leads all the States, with an annual product worth approximately \$40,000,000. Especially is it pre-eminent in the growing of the famous white burley, a popular variety for which there is always a good demand. In hemp the Blue Grass region of the State grows practically the entire supply of the United States. The crop of hemp in 1909 was 6,500,000 pounds. All the grasses and forage crops do well in practically all portions of the State. Timothy yields big crops, as much as three tons to the acre having been cut, and the hay is peculiarly appetizing and nutritious, a fact to which is attributed something of the superiority of Kentucky-bred race horses. Alfalfa growers get from four to six tons an acre in good seasons. Rye, barley or buckwheat are found on almost every important farm in the State in larger or smaller quantities.

The combination of soil, climate and market facilities make trucking a profitable business in various portions of Kentucky, and it is engaged in to a considerable extent. All the truck crops yield well—sweet potatoes, cabbage, cauliflower, peas, beans, onions, beets, radishes, turnips, asparagus, kale, spinach, cucumbers, watermelons, canteloupes—everything that goes to complete the most comprehensive bill of fare. Strawberries, dewberries, blackberries and raspberries also produce well and are cultivated to a considerable extent. Louisville, Lexington, Covington and other towns of the State furnish the growers with a market for a large portion of their output, while Cincinnati, Indianapolis, Chicago and other outside cities are close enough to be easily reached by the various railroad lines that penetrate all sections.

The mountain section of the eastern portion of Kentucky furnishes exceptional opportunities for the cultivation of apples, the fruit there growing to entire perfection where properly cared for. Commercial orcharding has not been developed to any considerable extent throughout that section, but it is undoubtedly one of the branches of husbandry that will find extensive development in the near future. The gray limestone soils of the central portion of the State are also of great excellence in apple culture, and many fine orchards are seen there. Peaches make an excellent crop in both those divisions, and also in the rich lands of the Jackson Purchase, where numerous large orchards have been found profitable. Pears, plums and cherries also bear well in these sections. Orchardring is receiving much more attention in the State than ever before, and the most scientific methods of care and culture are being practiced, with results that are satisfactory to those engaged in the business, and which will unquestionably cause many others to enter it.

In addition to raising fine horses, mules, sheep, hogs and beef cattle for market, Kentucky has extensive dairy interests, which are rapidly growing to more importance. Pure bred dairy stock is used in all the important dairies of the State, and record-breaking milkers have been produced. Around all the cities and large towns of the State are dairies that cater to the local trade, while in some sections are establishments that ship thousands of dollars' worth of their products to other markets. One dairy near Lexington has about 1000 cows, chiefly Jerseys, and ships certified milk to Louisville, St. Louis and Chicago. Blue Grass butter is noted in all the leading markets and brings top prices in all.

The poultry business is also reaching a position of great importance in the State. The climate and soil seem specially adapted to the production of high-bred fowls and they mature early, are strong and healthy, and lay eggs and multiply in great numbers. The business is being largely and rapidly increased as the demand for poultry increases throughout the country. Kentucky annually ships many thousands of turkeys to Eastern and Western markets.

In mineral resources, Kentucky is particularly rich. In addition to coal, it has asphalt, barytes, cement rock, clays, fluorspar, glass sand, infusorial earth, iron ore, lead, lime, mineral waters, natural gas, petroleum, zinc and building stone. The coal area is 16,700 square miles, twice the coal area of Great Britain and only a few hundred square miles less than the coal area of Great Britain, Germany, France, Austria, Belgium and Italy combined. Experts of Connellsville, Pa., a region which has claimed pre-eminence for the quality



of its coking coal as well as quantity for it, the leading coke-making center of the country, now admit that the Elkhorn coal of Eastern Kentucky makes a much higher grade of coke than Connellsville. They claim that Eastern Kentucky has the largest field of high-grade coking coal known in this or any other country. About \$50,000,000 are being expended in the purchase and development of coal properties in that territory and in the construction of railroads to open up this field. One company is carrying out a development scheme on so large a scale that it is expected to have an output of 7,000,000 tons a year, which is said to be the largest coal mining undertaking ever projected by one company for what is practically one operation. In the western coal field, mining enterprises are likewise being extended on a large scale. The output of coal in Kentucky in 1911 was 11,000,000 tons, but these figures will be swelled very rapidly now that these new mining operations are getting into the active producing period. Extensive gas fields are found also, and for a number of years the product of many wells in the northern portion of the State has been piped elsewhere for lighting, power and fuel purposes. Oil has been found at a number of points in the State, and it is expected that the near future will see Kentucky numbered among the important producers of both oil and natural gas.

In the heavily timbered portions of the State, hundreds of mills are at work turning the products of the forests into merchantable form, and the output of lumber reached, in 1910, 753,556,000 feet. There are also many stave mills and general woodworking plants at various points. Altogether, the lumber industry and the interests that go with it form a large part of the industrial life of the State.

In general manufactures Kentucky has rapidly advanced in the past few years, the value of the factory products having risen from \$126,000,000 in round numbers in 1900 to \$224,000,000 in 1909. The manufacturing business includes shoe factories, tanneries, sawmills, box factories, stave, barrel and all kinds of woodworking plants; steel mills, machine shops, foundries, tool works, brass foundries, general metal industries; cotton and woolen mills, knitting mills, clothing factories, breweries, distilleries, creameries, canneries, potteries, brick plants, tile works, cement plants, wagon and carriage works, tobacco factories and many others of a miscellaneous character that give employment to many people and largely swell the wage roll of the State. Louisville, the State's chief city, is also its chief manufacturing point, and it has a very large number of plants that do an enormous business. A number of its leading concerns have made very marked progress in the development of foreign trade. Many towns of the State are offering special inducements to those who desire to engage in manufacturing enterprises, besides the advantages of raw material, transportation facilities and labor supply. Among these is exemptions from taxation for a period of five years.

Of immense value in the development of the manufacturing interests of the State to their highest degree of profitable productivity will be the numerous water-power sites which are found along the many streams. The physical

conformation of the State, with its rivers flowing down from mountainous districts to seek the level of the sea, makes for great water-powers, and these abound in all the streams. The potentialities of the leading rivers, the Tennessee, the Cumberland, the Green, the Kentucky, the Licking, the Big Sandy, and the many smaller streams through all parts of the State, are estimated at 1,500,000 horse-power. Of this immense amount only a small fraction has been developed, and the remainder awaits the coming of the time when the demands of business shall imperatively call for its being brought into use. The resources of Kentucky for mining, manufacturing and agriculture are vast and varied. All things considered, there is probably no more richly endowed area in the world.

Railroad facilities are afforded to nearly all portions of the State by the lines of the Southern, the Louisville & Nashville, the Mobile & Ohio, the Queen & Crescent, the Chesapeake & Ohio, and a number of other railroads that traverse it in every direction. Important developments along that line are the branch lines the Baltimore & Ohio and the Louisville & Nashville are building into the coal fields of the Elkhorn region, and the extension of the Carolina, Clinchfield & Ohio from Southwestern Virginia to the headwaters of the Big Sandy. These will add materially to the State's facilities for reaching the markets with its products.

The educational advantages offered by Kentucky are noteworthy. The State has a progressive system of public schools, headed by the State University at Lexington, and embracing agricultural and other technical schools, followed in turn by high schools and an efficient system of graded schools. The State expends about \$5,000,000 annually in support of its public schools. In addition to the public schools, there are private institutions of high character—colleges, universities, seminaries, academies and professional and technical schools—in many of the towns, all of which, as well as the public schools, are well attended.

In numerous sections of Kentucky, lands are still very cheap, and men of small means can purchase good farming lands at moderate prices. The inducement to men of industry and enterprise is, therefore, very great.

With a by-product coke plant under construction in Eastern Kentucky, and in the same section another modern coke plant about completed by a company headed by a Connellsville man for many years noted as one of the foremost coke makers in America, added to the vast movements in coal mining by heavy operators which are being aggressively pushed, it seems certain that Kentucky will rapidly take a leading position in coal mining and a dominant position in coke making.

The natural resources in soil, minerals and timber furnish a basis for material development far greater than has yet been seen in the State, and with the more active work for the State's upbuilding now in evidence everywhere, Kentucky should in the near future make a growth commensurate with its remarkable advantages.

#### KENTUCKY SUMMARIZED STATISTICALLY.

##### Land Area, 40,181 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,648,690	1,858,635	2,147,174	*2,317,000
Manufactures: ‡				
Capital .....	\$45,813,000	\$79,812,000	\$104,071,000	†\$172,779,000
Products—value .....	\$75,483,000	\$126,720,000	\$154,166,000	†\$223,754,000
Cotton Mills:				
Spindles active .....	9,022	42,942	66,633	96,452
Looms active .....	73	677	991	1,437
Cotton used, pounds .....	1,882,234	5,751,305	11,971,815	14,057,796
Cottonseed Oil Mills:				
Products, value .....			\$4,683,343	
(No separate figures for 1880, 1890 and 1912.)				
Pig-iron made, tons .....	51,525	47,861	71,562	68,760
Coke made, tons .....	4,250	12,343	95,532	*70,000
Lumber cut, feet .....	305,684,000	420,820,000	765,343,000	†632,415,000
Improved farm lands, acres .....	10,731,683	11,818,882	13,741,968	\$14,334,000
Farm lands, buildings, value .....	\$299,298,631	\$346,339,360	\$382,004,890	\$863,782,000
Agricultural products, value .....	\$63,850,000	\$65,948,000	\$123,267,000	*\$219,073,000
Cotton crop, running bales .....	1,367	873	324	*1,000
Grain, bushels:				
Corn .....	86,040,000	63,645,000	69,267,000	109,440,000
Wheat .....	10,565,000	9,152,000	12,443,000	6,860,000
Oats .....	7,026,000	3,954,000	9,309,000	4,035,000
Livestock:				
Cattle .....	807,000	1,007,165	1,083,000	959,000
Sheep .....	1,000,000	937,124	1,297,000	1,320,000
Swine .....	2,225,000	2,036,746	1,955,000	1,724,000
Mineral products, value .....	\$1,583,295	\$4,315,997	\$7,102,364	*\$21,600,000
Coal mined, tons .....	946,288	2,701,496	5,328,964	*15,500,000
Iron ore mined, tons .....	51,525	77,685	52,920	**70,000
Petroleum, barrels (including Tennessee) .....		6,000	62,259	500,000
Railroad mileage .....	1,530	2,942	3,094	3,976
National Banks:				
Resources: .....	\$33,333,221	\$48,962,867	\$65,758,545	\$123,288,627
Capital .....	\$10,146,500	\$14,853,500	\$12,842,595	\$17,565,900
Individual deposits .....	\$8,510,630	\$17,188,664	\$27,755,375	\$61,942,583
Other banks, deposits .....	\$13,501,787	\$27,500,082	\$34,044,105	\$74,994,395
Common school expenditures .....	\$1,069,030	\$2,140,678	\$3,037,908	\$85,649,000
Property, true value .....	\$902,000,000	\$1,172,232,000	\$1,365,100,000	*\$1,818,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910. \*\*Including West Virginia.

## LOUISIANA

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories . . .</b>	<b>\$24,205,000</b>	<b>\$57,807,000</b>	<b>\$121,182,000</b>	<b>\$272,000,000</b>
<b>Farms . . . . .</b>	<b>\$42,884,000</b>	<b>\$54,344,000</b>	<b>\$72,667,000</b>	<b>\$113,421,000</b>
<b>Forests . . . . .</b>	<b>\$2,941,000</b>	<b>\$9,575,000</b>	<b>\$29,015,000</b>	<b>\$110,242,000</b>
<b>Mines . . . . .</b>	<b>\$48,000</b>	<b>\$423,000</b>	<b>\$789,000</b>	<b>\$18,150,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



LOUISIANA has an area of 58,506 square miles, of which 3097 are covered with water. Its acreage is 29,061,760. Of this amount 13,000,000 acres are covered with alluvial soil and the remainder is upland. At the present time only about 5,000,000 acres of the total is in cultivation.

The alluvial lands are those lying on the rivers and bayous and in the marshes about the coast of gulf and lakes. Some of them lie so low as to be subject to overflow, and for their protection an extensive system of "levees" has been built, behind which immense yields of various crops are grown, for there is no more fertile soil to be found anywhere than in these Louisiana lowlands. Other portions of these lands are wet prairies and others swampy, both of which must be drained to become available for agricultural uses. This is being done in various portions of the State; in some upon a very large scale, and hundreds of thousands of acres will be reclaimed and made productive in the next few years. When drained and properly prepared for cultivation these wet lands are extremely productive, and their draining will add greatly to the agricultural strength of the State. The reclamation of the wet lands of the State has for several years commanded much attention, Western people taking the lead in vast drainage plans and the colonization of these reclaimed lands, but now local land operators and capitalists are seeing the almost unlimited potentialities which are afforded by these conditions and are joining actively in the work. The ease with which these lands can be drained, their marvelous fertility and their adaptability to the widest agricultural diversity promise to duplicate in many sections the remarkable achievements in the rice-growing area of the State. The uplands are practically all susceptible of cultivation, their productiveness being astonishing, in some instances hardly less than that of the alluvial lands. The crops principally grown are cotton, corn, sugar cane, rice, peanuts, sweet potatoes, Irish potatoes, hay, oats, tobacco and the various kinds of truck. There is considerable stock raised, consisting of cattle, hogs and sheep, and many horses and mules. In some portions of the State oranges are grown to a considerable extent, the production of this fruit for 1910 being reported at 181,880 boxes. Peaches, figs, plums, pears and apples are produced, and strawberries and other small fruits are grown in abundance.

The climate of Louisiana makes a large part of the State delightful for winter and thousands of visitors are drawn there on that account, while during the summer the temperature rarely rises to the extremes of the North and West. The average high temperature is 65°, the average low is 50°, the mean average is 57°. The breezes from gulf and rivers keep down the heat, which is less oppressive than that of many localities much farther north. The winters are usually mild and pleasant, with very few days uncomfortably cold.

Probably no other State has so many navigable rivers, lakes and bayous, the total stretch of navigable water within Louisiana being 4794 miles. The most important rivers in this respect are the Mississippi, with 560 miles; the Red, with 510; the Sabine, with 387; the Boeuf, with 300; the Achafalaya, with 218, and the Ouachita, with 217. Lafourche Bayou is navigable for 318 miles and Macon Bayou for 200 miles. This immense mileage of navigable water is of great advantage to the people of the State, furnishing them cheap and easy means of transportation in reaching local markets and shipping points. Moreover, in draining large tracts of land, wide channels are cut with a depth of water of 6 to 8 feet connecting these lands with one or more rivers or bayous, and this will eventually add hundreds of miles of water transportation. These facilities are supplemented by 5317 miles of public railway lines, while plantation, logging and other railroads of a private nature, with 1238 miles of trackage, permeate many portions of the State. The Gulf of Mexico, forming the southern boundary, and to the waters of which the Mississippi leads down past New Orleans, gives outlet by steamships to the ports of all the world.

Much of the State is heavily timbered, consisting of cypress, pine, juniper, oak, maple, ash, elm, gum, buckeye, birch, willow, walnut, cottonwood, beech

and numerous other varieties of greater or less value. The present forest area of the State is approximately 16,000,000 acres, and the timber standing runs into the billions of feet. Many millions of dollars have been invested in these timber lands during the past few years and numerous mills and woodworking plants of various kinds have been established to work the forest products into merchantable form. This State leads the South in the lumbering industry with a cut of nearly 4,000,000,000 feet a year, one of its mills having a record of 700,000 feet in one day. In oil, gas, salt and sulphur the State is extremely rich. Louisiana produces more than half of the world's sulphur output. The big fields at Jennings, Caddo and other points, with their immense wells, have brought the State in the last few years into a leading position in oil production, the output in 1912 having been 16,000,000 barrels. Gas wells have been struck in various sections and experts figure that the richest gas field in the United States is in the Caddo district. Salt, almost absolutely pure, lies in great beds in Louisiana, the salt deposits of the State being the largest known in the country.

There are also gypsum, glass sand, clays for brick making and pottery use, mineral waters, sand and gravel.

The Gulf of Mexico on its southern border, and the bays, bayous, lakes, lagoons and rivers that abound throughout the State, furnish Louisiana with a wealth of resource in fish and oysters and water fowl, the importance of which is hard to estimate. Game abounds in the large forest areas, and Louisiana is the paradise of the hunter.

Agriculture is the leading industry of the State so far as the number of people employed is concerned, but the value of manufactured products largely exceeds the value of all farm products. When the boll weevil invaded Louisiana the cotton growers of the State turned their attention largely to diversified agriculture and, while the cotton yield decreased, the production of corn increased so rapidly that the State's crop now amounts to about 50,000,000 bushels a year, which is double the crop of 1900. Rice has become a very important crop within recent years, and Louisiana now holds first place among the States in the production of that cereal. The output last year was 11,812,000 bushels. There is a very large area of land yet undeveloped which is particularly adapted to rice cultivation. About 25 years ago pioneers opened up by reclamation a region which had been esteemed as valueless and began rice growing. Land which was then worthless is now producing millions of bushels of rice, thriving towns dot the region and it is estimated that \$200,000,000 of values have been created by this industry. Rice growing early appealed strongly to Western wheat growers, resulting in a heavy movement of population from Iowa and neighboring States to the Louisiana rice district. Some of the Louisiana soils have been found to produce good crops of the varieties of tobacco in large demand for plug, wrapper and smoking tobacco, as well as for high-grade cigars, and considerable attention is now being given to that branch of farming. The well-known "perique" and other favorite tobaccos are produced. Modern methods of cultivating and curing the crop are now being put into practice by the growers, and the tobacco industry promises to become of much importance in the near future. Louisiana produces far the larger part of the sugar grown in the United States, its annual output being approximately 725,000,000 pounds of sugar and several million gallons of molasses. The parishes that lead in sugar production are St. Marys, with 121,000,000 pounds; Lafourche, with 72,000,000; Ascension, with 63,000,000; St. Martin, with 61,000,000; Terrebonne, with 59,000,000; Iberville, with 56,000,000; Iberia, with 50,000,000.

Irish potatoes, sweet potatoes, oats, peanuts and numerous grasses and forage crops are produced in all sections. Of the grasses, Bermuda and crab grass are perhaps most widely grown. These are both excellent for pasturage and for cutting for hay, and both are big producers. Lespedeza, rescue grass, red top, red clover, alfalfa, the vetches, burr grass, velvet beans, cowpeas, German millet and many other hay and forage crops can be grown in practically all sections of the State and in most of the various soils.

Recently the trucking business has been largely developed in certain por-



tions of the State, and now hundreds of carloads of vegetables are shipped each spring to the markets of the Middle West. The principal vegetables grown are radishes, beans, cucumbers, cabbage, cauliflower, lettuce, eggplant, sweet peppers, spinach, beans, peas, carrots, onions, tomatoes, canteloupes and watermelons. One town alone shipped during one season 65,000 bushels of radishes. Enormous quantities of early strawberries are grown, and from almost every town in Tangipahoa parish they are shipped in carload lots, the total of cars each year running into the hundreds. Irish and sweet potatoes, mentioned above among the field crops, are grown in large quantities in the trucking districts and get to market at a time when prices are good.

Stock raising is being more extensively engaged in than formerly. Beef cattle can be raised and fattened as economically as in any other section of the country and much more so than in most. The mild climate, bringing forth good pasture during most of the months of the year and allowing the stock to feed outdoors all the time, the luxuriant growth of the best of grazing and forage grasses and legumes, and the cheap feed that comes from rice mill, cotton-seed mill and sugarhouse—all these things combine to make an ideal breeding, feeding and fattening ground for cattle. In view of experiments that have demonstrated these things, farmers are turning their attention more and more to the breeding of good beef stock, and high-grade cattle are rapidly taking the place of the small native stock that formerly roamed the prairies and fed on the uplands and in the marshes of the State. Dairying is also being carried on to an increasing extent, and some excellent dairy herds are being gathered together in various places.

Hogs are easily raised, and that line of farming is being increased from time to time. There are so many grasses and roots and forage crops grown in Louisiana which the hog finds especially adapted to him that he in many instances gets his growth and puts on plenty of flesh without being fed at all. It is said that farmers who know how to handle hogs can raise them for half a cent a pound. Sheep are also being grown with profit by some farmers.

Of late the farmers of Louisiana have been raising most of their own horses and many of the mules they use, whereas they formerly purchased both in other States. The same reasons that apply to the raising of other stock apply to these—cheap provender and mild climatic conditions.

Poultry raising is another branch of farming that is being found profitable, not only as a "side line" to the general farming, but as a distinct business. Many poultry farms have been established recently and the product raised for the market. Chickens, turkeys, ducks, geese, guinea fowls and pigeons are all found profitable when properly handled. The best bred fowls known to the business are being utilized, and Louisiana raisers can show as fine pens as are to be found anywhere.

In manufacturing, Louisiana has recently made rapid strides, the output

of its factories running from \$24,205,000 in 1880 to \$57,807,000 in 1890, rising to \$121,182,000 in 1900, and reaching \$223,928,000 in 1909. Cotton fabrics, cottonseed products, lumber and woodworking plants turn out a large portion of this product, but diversification in manufacturing will certainly come with appreciation of the vast supplies of natural gas, and the general advantages of proximity to raw materials of various kinds, the increasing demands of the country nearby and the facilities of transportation by which markets for the products can be easily reached. Experts hold that Louisiana is the most advantageous point in the United States for the development of great chemical interests by reason of its abundant stores of oil, gas, salt, sulphur, and other raw materials for chemical manufacturing. For some years the sulphur interests of Louisiana have dominated the sulphur trade of the world, more than half the world's output of sulphur being produced in this State. A large amount of capital was sunk by different interests in the endeavor to win the sulphur which had been found in boring for oil, but owing to the peculiar conditions existing in the overburden and much quicksand, these efforts all proved futile for many years. Local people regarded the property as worthless by reason of the heavy losses resulting from efforts to operate it, but a method was finally adopted of melting the sulphur in place by pumping superheated water down into it, which made it possible to pump the melted sulphur out. This process gave immediate success to the industry and made the Louisiana sulphur the ruling force in the trade in Europe as well as in America. The industry has proven phenomenally profitable, but its success came only after years of work and such financial loss that the property was discredited and in Louisiana considered to be worthless. It is now believed that this sulphur industry, taken in connection with the apparently almost limitless supplies of salt and gas and abundance of oil, will finally result in the development of chemical interests which by reason of natural advantages will make Louisiana almost as dominant in some lines of chemical manufacture as for several years it has been in sulphur.

In agriculture there has been a marked advance, but it is in the manufacturing and mining interests that the growth has been most pronounced. The value of factory products in 1912 was almost five times as great as in 1890, the value of forest products eleven times as great, and the output of mines twenty-four times as great. These figures, remarkable as they are, will probably be surpassed in the magnitude of growth, even if not in percentages, during the coming years, for Louisiana seems to have reached a point where its own people and the outside world are so awakening to its potentialities in agriculture, in diversified manufactures and in commerce that all that has been achieved is merely the pioneering work of getting ready for great growth.

Louisiana has a public school system that is being rapidly and surely extended and improved, supplemented by numerous private and denominational schools that furnish the young with the best of educational opportunities.

### LOUISIANA SUMMARIZED STATISTICALLY.

Land Area, 45,409 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	939,946	1,118,588	1,381,625	*1,710,000
Manufactures: †				
Capital .....	\$11,462,000	\$34,754,000	\$113,084,000	‡\$221,816,000
Products—value .....	\$24,205,000	\$57,807,000	\$121,182,000	‡\$223,949,000
Cotton Mills:				
Spindles active.....	6,096	46,200	55,600	45,300
Looms active.....	120	1,200	1,584	1,010
Cotton used, pounds.....	644,000	6,006,000	7,282,350	7,126,518
Cottonseed Oil Mills:				
Products, value.....	\$3,739,466	\$1,573,626	\$7,026,452	‡\$4,497,000
Lumber cut, feet.....	133,472,000	303,591,000	1,113,423,000	‡\$3,566,456,000
Improved farm lands, acres.....	2,739,972	3,774,668	4,666,532	\$5,268,000
Farm lands, buildings, value.....	\$58,989,117	\$85,381,270	\$141,130,610	\$§238,682,000
Agricultural products, value.....	\$42,884,000	\$54,344,000	\$72,667,000	*\$113,421,000
Cotton crop, running bales.....	508,569	659,180	713,929	*396,000
Grain, bushels:				
Corn .....	14,913,000	16,979,000	24,702,000	33,815,000
Oats .....	405,000	567,000	614,000	734,000
Livestock:				
Cattle .....	428,000	539,128	670,000	804,000
Sheep .....	136,000	186,167	220,000	176,000
Swine .....	633,000	569,935	788,000	1,642,000
Mineral products, value.....	\$48,000	\$423,125	\$789,219	*\$18,150,000
Petroleum, barrels.....				10,000,000
Railroad mileage.....	652	1,740	3,801	5,392
National Banks:				
Resources .....	\$13,255,603	\$27,999,264	\$33,526,485	\$84,042,721
Capital .....	\$3,475,000	\$4,325,000	\$3,285,000	\$8,320,000
Individual deposits.....	\$6,013,173	\$14,783,880	\$20,308,028	\$40,187,107
Other banks, deposits.....	\$4,719,465	\$8,915,011	\$15,968,225	\$77,159,368
Common school expenditures.....	\$411,858	\$817,110	\$1,135,125	\$§4,252,000
Property, true value.....	\$382,000,000	\$495,302,000	\$815,200,000	*\$1,423,000,000

\*Partly estimated. †Not including neighborhood industries and hand trades in 1909. ‡Figures of 1909. §Figures of 1911. §Figures of 1910.

# MARYLAND

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	<b>\$106,781,000</b>	<b>\$171,843,000</b>	<b>\$242,553,000</b>	<b>\$383,000,000</b>
<b>Farms....</b>	<b>\$28,839,000</b>	<b>\$26,443,000</b>	<b>\$43,823,000</b>	<b>\$73,268,000</b>
<b>Forests....</b>	<b>\$3,021,000</b>	<b>\$2,666,000</b>	<b>\$4,416,000</b>	<b>\$6,950,000</b>
<b>Mines.....</b>	<b>\$3,731,000</b>	<b>\$6,200,000</b>	<b>\$11,942,000</b>	<b>\$12,000,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



MARYLAND is divided, according to popular geography, into three parts—the Eastern Shore, the Chesapeake Bay, which is the divider, and the Western Shore, with five of the lower tier of counties lying between the Bay and the Potomac River, constituting Southern Maryland. Physiographically, it divides into the Appalachian Region, the Piedmont Plateau and the Coastal Plain. Its economic activities fall into four main groups—manufacturing, agriculture, mining and fisheries, the fourth capable of being brought to a productive capacity equal to that of the third.

Though it fronts but sixty miles upon the ocean, its advantageous position on the Middle Atlantic Coast, together with its 2350 square miles of water surface, comprising nearly one-fifth of its total area, and its mountain ranges in the west, assure for it an equable climate, with mean temperature for the year ranging from 55.6 degrees in the southern portion to 54.5 in the eastern and 52 in the western. The State's greatest width from east to west is 240 miles, and its greatest length is 125 miles, the length gradually decreasing toward the west, and farm opportunities are indicated in the fact that the signs of spring appear in the lower end of the peninsula between the Potomac and the Chesapeake, where there are altitudes from tidewater level to 100 feet above, a month or six weeks earlier than in the highlands of the west, where the greatest elevation in the State is Allegany Heights, 3187 feet.

The planting of tobacco in provincial days under the policy which prevailed in so much of the administration of the Southern colonies fastened the plantation system upon a goodly portion of the State and determined that agriculture should be the dominant activity for several generations. But quite early in its history its forests and its minerals formed the bases for a vigorous manufacturing life, and the upper reaches of the Bay or its estuaries became the seat of trade, at first with the aborigines, and after with neighbor colonies and with the European countries. Changes in government, revolutions in industrial methods and improvements in means of transportation have not caused the State to depart materially from its original bents, so that today the relative proportions of its different activities show no more variation from their status in 1790 than does the center of population, which in that year was twenty-three miles east of Baltimore, and which has since moved more than 558 miles west, from closeness to latitude 39 degrees North.

Maryland smelted its iron ores as early as 1649, and was shipping wrought iron to England sixty-one years later, and the same ores are still smelted in one of the few surviving charcoal furnaces of the country within a short distance of Washington City, the product having peculiar qualities which commend it to the United States Government. Though the coke era in iron-making in this country is of comparatively recent coming, coke was so used at Frostburg, Md., as early as 1837. Maryland suffered with other Eastern States as to its iron industry with the swing of iron-making toward the West, following the discovery of the vast ore reserves in the Lake Superior region in the eighties. But a counter influence appeared just about that time in the establishment on the Patapsco, within a few miles of Baltimore, of a steel and shipbuilding plant, using ores brought from Cuba and other foreign parts, and coke from West Virginia and Pennsylvania until it installed its own coke by-product plant. This had the effect not only of bringing iron and steel-making in the State to a point that it had never before attained, but also of adding to the prestige of Baltimore as a shipbuilding center, the year just closed having seen vessels valued at \$4,000,000 constructed, with contracts on hand for others amounting to quite as much.

The State is no more noted for its shipbuilding, dating back to colonial days and attaining world-wide fame through the Baltimore "clippers" of a century ago, than for its cotton duck, an outgrowth of Baltimore's importance as a shipbuilding and commercial center, which for many years has not only overshadowed other textile products of the State, but has made Baltimore the greatest cotton-duck manufacturing center in the world. In 1909 the mills turned out 13,872,294 square yards of duck, valued at \$3,478,113, which was about 63 per cent. of the total value of the textile output of the State.

Closely related to the textile industry is the manufacture of clothing, the most important industry in the State, in which Maryland ranked fourth in 1909 among the States as to men's clothing and eighth as to women's clothing, the two branches turning out products valued at \$41,272,000.

The largest copper refining plant in the world is on the Patapsco, just

outside the city limits of Baltimore, and it accounts for annual exports from that city of more than 200,000,000 pounds of copper, valued at \$25,000,000.

Packing oysters in hermetically sealed cans was begun in this country at Baltimore about eighty years ago, and was one of the germs of the canning and preserving industry, handling fruits, vegetables, fish and oysters, and including the manufacture of pickles, preserves and sauces, in which Maryland ranks fourth among the States.

Other leading industries are slaughtering and meat-packing, with an output of \$13,683,000; lumber and timber products, \$12,134,000; foundry and machine shops, more than \$12,000,000; tobacco manufactures, more than \$11,000,000; fertilizers, \$9,673,000; flour and grist mills, \$9,268,000, and cars and general shop construction for steam railroad companies, \$9,059,000.

The State ranks second in the South in the value of manufactured products, the increase between 1880 and 1912 having been from \$106,781,000 to \$383,000,000, and representing the output of 170 distinct lines of manufacturing.

This industrial life, supplying for many years the bulk of the export trade of Baltimore, has been maintained in large degree by accessibility to raw materials and fuel. Within its own borders Maryland has 455 square miles of coal area, with an estimated original supply of something more than 8,000,000,000 tons, of which more than 250,000,000 tons have been mined. The coals, of the semi-bituminous class, have great value for steam and smithing processes.

There is a rich variety of rocks in the State for building and decorative purposes, such as granites, gneisses, marbles, serpentines, limestones, quartzite, sandstones and slates. Clays for common brick, terra-cotta, sewer pipe, pottery and refractory materials abound, as well as flint, vein quartz, feldspar and kaolin for porcelain, and the limestone and marble deposits have wide use as flux in iron-making and in the manufacture of Portland cement, which already counts two important plants. Glass sands are found in one of the lower counties bordering on the Bay, and in the western part of the State are deposits of pure quartz which have been used in glass-making. In the eastern and southern parts of the State are rich marl deposits, containing phosphoric acid and potash, which are valuable as fertilizer for some crops, and tripoli, a diatomaceous earth, abounds in Anne Arundel, Talbot and Charles counties to a thickness of thirty or forty feet, and is produced in Maryland in greater quantities than in any other part of the country.

As is suggested by these references to minerals, the State is well supplied with materials for road-building, and much progress has been made in the construction of improved highways under the auspices of the State government or county authorities, or in co-operation of both. Among the other minerals are copper ores, chrome, lead and zinc, iron pyrites, soapstone, asbestos, mica and graphite in small quantities or as traces.

Mineral industries of Maryland now yield about \$12,000,000 annually. Its waters have yielded in one year as much as \$10,000,000. It is likely that the income from the mines will gradually diminish as their resources are more completely worked. But the Chesapeake is, in a certain sense, a mine that need never be exhausted, provided proper precautions are taken, and a mine that may be made to yield annually more than all the mines of the State ever produced.

In 1908, the latest year of which official figures are available, Maryland fisheries, with a product valued at \$3,306,000, and employing between 17,000 and 18,000 persons, ranked fifth among the States of the country. The products included 6,232,000 bushels of oysters, valued at \$2,228,000; 20,373,000 pounds of crabs, valued at \$319,000; 3,937,000 pounds of shad, valued at \$247,000; 12,293,000 pounds of menhaden, valued at \$30,000; alewives, black bass, blue fish, butterfish, carp, catfish, croakers, flounders, mackerel, perch, sea bass, spot, striped bass, clams, terrapin, turtles, etc. Though there are fisheries in the Atlantic waters of the State, the Chesapeake Bay is the great fishing and oystering ground, and one ideally fitted for commercial oyster culture.

Some years ago Dr. William K. Brooks of the Johns Hopkins University, who made a special investigation of the oyster industry, pointed out that the Chesapeake Bay receives the drainage of more than 40,000,000 acres of farm lands in New York, Pennsylvania, Maryland and Virginia, which deposits all over the bottom of the Bay a rich alluvium containing an endless variety of microscopic plants and animals, furnishing the best sort of food for oysters. More than 400,000,000 bushels of oysters have been taken from the Bay, and in recent years the demand for them has been so great that there



has been danger of extermination of the supply. Under the auspices of the State Shellfish Commission, however, considerable progress has been made toward placing the oyster industry upon an economic basis, providing for a maintenance of the present sources of supply and looking to an extension of the grounds through scientific culture. Of 1,016,100 acres beneath Maryland tidewaters which have been classified by the Commission, 215,968 acres are natural oyster bars and 100,800 acres barren bottoms suitable for oyster culture. Several thousand acres have been surveyed and leased.

Wise conservation is also needed for other water wealth of Maryland, and there is some co-operation between the State and the National authorities in maintaining through hatcheries supplies of fresh and salt-water fish. The United States Fish Commission distributed in Maryland and adjacent waters five years ago 24,362,000 shad fry, and into the fresh-water streams have also been placed the young of several varieties of game fish.

Among the elements of the food for the finfish and the shellfish of the State are the rich washings from its soil, containing the results of nature-chemistry's manipulation of geologic formations. These are so diverse and the range of altitude in the State is so great that diversified farming is quite to be expected. This is reflected in the quantities and values of farm crops as given in the census of 1909.

The total value of such crops in that year was \$43,920,149, of which \$21,908,730 represented 17,911,436 bushels of corn, 9,463,457 bushels of wheat, 1,160,663 bushels of oats, 357,562 bushels of rye, 152,216 bushels of buckwheat, 135,454 bushels of barley and several thousand bushels of emmer and spelt, Kaffir corn and milo maize, beans, peas and grass seeds; \$6,911,749 represented 477,564 tons of hay and forage; \$1,782,954, 3,444,311 bushels of Irish potatoes; \$1,457,112, 17,854,699 pounds of tobacco; \$483,751, 1,065,956 bushels of sweet potatoes and yams, and about \$38,000, willows, broom corn, cotton, hemp and

hops. Strawberries, blackberries, dewberries, raspberries, currants, gooseberries and other small fruits were produced to the amount of more than 52,000,000 quarts, while apples, peaches, pears, plums, prunes, cherries, apricots and other orchard fruits had a value of \$1,517,400; maple sugar and syrup, \$34,386; dairy products sold, \$4,784,232; poultry products, \$5,831,000, and domestic animals sold and slaughtered, \$5,400,000.

Nearness to ever-widening markets in New York, Philadelphia, Wilmington, Baltimore and Washington is an advantage which agricultural Maryland enjoys as few other States do, and the variety of soils makes it possibly to raise practically every necessary food crop or feed crop. Small fruit-growing and truck-growing are followed more extensively on the Eastern Shore than in any other part of the State, though in both particulars Southern Maryland has made rapid progress.

The Eastern Shore, too, was once the special home of the peach-raising industry, but the growth of that was checked just about the time that the highland regions demonstrated their adaptability to fruit-growing.

The cultivation of all lands, the proper handling of the remaining timber reserves and the utilization of many valuable water-powers are among the tasks before the people of the State of today and those that shall come after. Fortunate in its general educational system, this State is especially fortunate in being the home of the Johns Hopkins University, the members of whose faculty have been to the front for twenty-five years in promoting and actively participating in all such undertakings as the Geological Survey, the Shellfish Commission, the Good Roads Commission, the weather service and other agencies necessary to the full enjoyment of Maryland's many natural resources.

Baltimore, the metropolis, is a leading financial center of the country, and its great banking resources have been potent in the material development of the South.

### MARYLAND SUMMARIZED STATISTICALLY.

#### Land Area, 9,941 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	934,943	1,042,390	1,188,044	*1,315,000
Manufactures: ‡				
Capital .....	\$58,742,000	\$119,667,000	\$163,147,000	†\$251,227,000
Products—value .....	\$106,781,000	\$171,843,000	\$242,553,000	†\$315,669,000
Cotton Mills:				
Spindles active .....	125,706	158,930	154,064	128,546
Looms active .....	2,425	2,965	2,810	2,800
Cotton used, pounds .....	24,166,232	27,265,667	39,901,955	29,645,000
Pig-iron made, tons .....	54,854	147,821	290,073	219,546
Coke made, tons .....				*260,000
Lumber cut, feet .....	123,336,000	82,119,000	183,393,000	†144,078,000
Improved farm lands, acres .....	3,342,700	3,412,908	3,516,352	\$3,353,000
Farm lands, buildings, value .....	\$165,503,341	\$175,058,550	\$175,178,310	\$240,774,000
Agricultural products, value .....	\$28,839,000	\$26,443,000	\$43,823,000	*\$73,268,000
Grain, bushels:				
Corn .....	21,702,000	16,333,000	15,233,000	24,455,000
Wheat .....	8,487,000	6,208,000	15,188,000	8,970,000
Oats .....	2,278,000	1,357,000	1,783,000	1,350,000
Livestock:				
Cattle .....	240,000	250,123	293,000	287,000
Sheep .....	171,000	132,329	191,000	230,000
Swine .....	335,000	312,020	318,000	345,000
Mineral products, value .....	\$3,731,280	\$6,200,000	\$11,942,000	*\$12,000,000
Coal mined, tons .....	2,228,917	3,357,813	4,024,688	*4,300,000
Iron ore mined, tons .....	54,855	35,657	26,223	*15,000
Railroad mileage (including District of Columbia) .....	1,040	1,391	1,364	1,615
National Banks:				
Resources .....	\$50,858,355	\$61,486,309	\$96,669,396	\$170,158,717
Capital .....	\$13,222,030	\$15,653,750	\$15,122,660	\$17,617,710
Individual deposits .....	\$21,431,763	\$30,955,946	\$42,941,481	\$86,157,395
Other banks, deposits .....	\$26,634,263	\$39,094,334	\$69,395,411	\$168,520,395
Common school expenditures .....	\$1,544,367	\$1,910,663	\$2,803,032	\$3,792,000
Property, true value .....	\$837,000,000	\$1,085,473,000	\$1,317,400,000	*\$1,868,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910.

### DISTRICT OF COLUMBIA.

#### Land Area, 60 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	177,624	230,392	278,718	*342,000
Manufactures: ‡				
Capital .....	\$5,553,000	\$28,865,000	\$41,981,000	†\$30,553,000
Products—value .....	\$11,882,000	\$39,331,000	\$47,668,000	†\$25,289,000
Improved farm lands, acres .....	12,632	9,898	5,934	\$5,000
Farm lands, buildings, value .....	\$3,632,403	\$6,471,120	\$11,273,990	\$88,476,533
Agricultural products, value .....	\$514,000	\$373,000	\$870,000	*\$1,474,000
National Banks:				
Resources .....	\$5,091,550	\$15,630,449	\$26,205,244	\$51,905,264
Capital .....	\$1,507,000	\$2,627,000	\$3,027,000	\$6,112,000
Individual deposits .....	\$2,154,594	\$10,626,082	\$18,210,911	\$26,150,000
Other banks, deposits .....	\$3,305,875	\$1,303,717	\$11,605,576	\$14,493,447
Common school expenditures .....	\$438,567	\$905,777	\$1,076,620	\$2,680,000
Property, true value .....	\$220,000,000	\$343,597,000	\$928,700,000	*\$1,225,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910.

## MISSOURI

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
Factories . . .	\$165,386,000	\$324,562,000	\$385,493,000	\$688,000,000
Farms . . . . .	\$95,913,000	\$109,751,000	\$219,297,000	\$411,625,000
Forests . . . . .	\$8,776,000	\$13,960,000	\$18,630,000	\$25,455,000
Mines . . . . .	\$4,736,000	\$13,795,000	\$13,408,000	\$54,000,000

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



MISSOURI, ranking first among the States of the South in the amount of capital invested in manufacturing and in the value of manufactured products, and second in population, in the value of mineral products, in the value of agricultural products and in the mileage of its railroads, has a diversity of activities and a scope of opportunities unexcelled, perhaps, by those of any other State of the country.

Divided by the Missouri River, which flows in a generally easterly direction from Kansas City to the Mississippi, a few miles north of St. Louis, Missouri has a broken and hilly surface in the northern portion, well watered and adapted to agriculture, with timber lands along the bluffs of the Mississippi and Missouri rivers, and in the southern portion timber lands dominate in the east and arable lands in the west, with easily-drained and productive lowlands in the southeast undulating toward the Ozark Hills. Within the State, which has a general range of altitude from 275 to 1000 feet, there are 243 elevations above 1000 feet, and the highest point is Cedar Gap, 1683 feet.

Authorities of the State have adopted the eminently practical policy of publishing every year a statement of surplus products, meaning commodities which are sent to market from the 114 counties, which illustrate admirably the manifold and multifarious lines of production. The statement for 1909, a typical one, showed, among the surplus products, having an aggregate value of \$342,542,903, live-stock valued at \$136,250,858; farm crops, \$38,462,756; farm-yard products, \$45,902,655; mine and quarry products, \$31,367,173; forest products, \$23,841,357; mill products, \$16,827,760; dairy products, \$14,570,935; fresh fruit, \$6,563,635; vegetables and canned goods, \$5,673,353; cotton products, \$4,061,161; packing-house products, not including output of establishments in the cities and larger towns, \$3,880,376; stone and clay products, \$3,545,303; liquid products, \$1,904,194; nursery products, \$1,570,547; wool and mohair, \$1,424,003; fish and game products, \$716,053; corn-cob products, \$448,454 (including so-called Missouri "meerschaum" pipes); apiary and cane products, \$162,139; medicinal products, \$93,665, and unclassified products, \$5,273,531. The unclassified products included 1,040,387 gross of pearl buttons and blanks, 110,510 tons of coke, 727,563 tons of ice, 425,000 pounds of anhydrous ammonia, 3,875,000 gallons of coal tar, 1,760,532 pounds of acetate of lime, 625,527 gallons of linseed oil and 5364 tons of linseed meal.

The southern boundary of the State is on the parallel of latitude 36° 30' North, known historically as the Missouri Compromise line, the line above which it was not thought that cotton could be raised economically on an extensive scale, but there are twelve counties in the State, ten of them north of the line, where soil and climate make possible the growing of cotton of a fine quality, and the annual crop increased from about 28,000 bales in 1900 to 93,000 bales in 1911. The cotton crop, with its \$5,000,000 annual value, however, constitutes but a small portion of the agricultural production of the State, for last year there were produced in the State 243,904,000 bushels of corn, valued at \$112,196,000; 23,750,000 bushels of wheat, valued at \$21,375,000; 37,125,000 bushels of oats, valued at \$12,994,000; 4,143,000 tons of hay, valued at \$40,601,000; 7,980,000 bushels of Irish potatoes, valued at \$5,506,000; rye, buckwheat, barley, flaxseed, sorghum, tobacco, grasses of various kinds, broom corn, a great range of vegetables and fruits, poultry and live-stock. Apples having a value between \$2,000,000 and \$3,000,000 rank first in fruit production, but peaches, grapes, plums, pears, strawberries, raspberries and blackberries are also raised in large quantities.

Between 1900 and 1909 the capital invested in the factories of Missouri, not including hand trades and neighborhood industries, increased from \$223,781,000 to \$442,343,000, or by \$218,562,000, equal to 98.1 per cent., and the value of factory products increased from \$316,304,000 to \$574,111,000, or by \$257,807,000, equal to 81.5 per cent. Since 1880 the total value of all manufactured products has more than quadrupled, increasing from \$165,386,000 to \$688,000,000.

Of 236 separate lines of factory industries in the South, 195 are represented in Missouri, that State leading the South in this particular. Some of the product values as of 1909 were meat packing, \$79,581,000; boots and shoes, \$48,751,000; flour and grist mills, \$44,508,000; printing and publishing, \$29,651,000; malt liquors, \$27,447,000; lumber, \$23,261,000; foundry and machine shops, \$19,975,000; bakeries, \$18,524,000; men's clothing, \$15,407,000; coffee and spice roasting, \$12,062,000; street railroad cars, \$9,812,000; carriages and wagons, \$8,469,000; copper smelting, \$7,827,000; patent medicines, \$7,639,000; furniture, \$7,380,000; paint and varnish, \$6,828,000; stoves, \$6,713,000; confectionery,

\$6,659,000; leather goods, \$6,508,000; women's clothing, \$5,439,000; food preparations, \$5,384,000; iron and steel works, \$5,013,000; soap, \$4,719,000; manufactured gas, \$4,638,000; pottery, \$4,069,000; brick and tile, \$3,676,000; chemicals, \$3,604,000; marble and stone, \$3,441,000; wire work, \$3,396,000; electrical machinery, \$3,251,000; cooperage, \$3,079,000; butter, cheese, etc., \$2,959,000; brass and bronze work, \$2,221,000; ice, \$2,084,000; tanned leather, \$2,035,000; glass, \$1,993,000; awnings, \$1,784,000; automobiles, \$1,677,000; millinery, \$1,647,000; canning, \$1,574,000; fancy boxes, \$1,376,000, and lime, \$1,031,000.

Impressive as is this array of industries, there are two or three worthy of special mention, perhaps because of their uniqueness and their possibilities. The more than 149,000,000 finished pearl buttons and blanks made in 1909 by five factories and having a value of \$267,794 varied in size from a quarter of an inch to an inch and a half in diameter, and were made from mussel shells obtained from the Mississippi River north of the Missouri, but not in as large quantities as formerly, from the Black and White rivers, and from interior streams of the State, though the manufacturers are now looking more and more to the Wabash, the Cumberland, the Tennessee and the Illinois for their supplies of raw material. The buttons go to nearly every State in the Union, and some of them have been shipped as far as England and Germany.

Seven factories turned out in 1909 nearly 28,000,000 corn-cob pipes, which required about 14,000,000 cobs for their bowls. For the making of these pipes, including cuttings, boring, sanding, smoothing, plastering, staining and varnishing, nearly a hundred operations and handlings are required, and more than 300 men and women are employed. The output goes to all parts of the world.

While the full opportunities of the State for cotton growing have not yet been realized, most of the cottonseed produced is crushed in factories in St. Louis, Kennett, Malden and Carruthersville, the oil going into various industries and the meal and hulls going back to the soil by way of feed for cattle.

The manufactured products carry back the thought to the natural resources of the State in its timber, its agriculture and its minerals, and their quantity and variety reflect the advantageous central location of the State for distribution of finished goods. The present forest area of the State is 18,300,000 acres, something more than 40 per cent. of the total land area. In 1880 the lumber cut was 399,744,000 feet, but between 1890 and 1900 the annual cut increased from 395,755,000 feet to 723,754,000 feet, following the marked improvement of the lumber industry to the South. There were variations in the annual cut after that, a marked one being the change from a cut of 548,774,000 feet in 1907 to 458,938,000 feet in 1908, and to 660,159,000 feet in 1909. The cut of 1911, however, was but 418,586,000 feet. The general tendency toward a diminution of the cut of lumber is a natural one, when are considered the increasing demands upon all the timber resources of the country and the gradual taking up of cut-over timber lands for farm purposes. It will be many years, however, before the lumber industry of Missouri ceases to be an important factor in the State's economy, and, by proper handling of surviving forests and by replanting, the supply of yellow pine, oak, maple, cypress, red gum, elm, cedar, hickory, ash, cottonwood, tupelo, sycamore, walnut, and other woods for general building operations and railroad construction, for cooperage, for veneers and other purposes may be maintained indefinitely.

Though there was considerable mining of iron ore and other minerals in the early days, Missouri lagged somewhat for a while in the utilization of its mineral wealth. The value of the production in 1880 was \$4,736,280, or something more than one-quarter of the total value of the production in the whole South. It rose to \$13,794,930 by 1890, but there was a decline in the next ten years. The value in 1911 was \$53,591,612, that sum being largely accounted for by the production of lead and zinc, in which great progress has been made in the past ten years, and the State now ranking first among the States of the country in the production of each. These two metals represent between 55 per cent. and 60 per cent. of the total value of the minerals produced annually. The principal zinc-producing counties are Jasper, Lawrence, Newton, Green, Barry, and a few others, and it is claimed that the zinc-producing region of Jasper county is the most valuable known in the world in proportion to its size. Deposits of the metal are known to exist in many parts of South Missouri, and, in view of important discoveries that have been made in recent years, it is fully expected that other extensive deposits are yet to be uncovered.

St. Francois, Jasper, Madison, Green, Jefferson, Stoddard, Washington, Lawrence, Newton, Miller, Franklin, Carter, Wayne, Phelps, Crawford, Maries,



Moniteau, Shannon and Iron counties are among the counties producing most of the lead ores, which are almost entirely free from silver, and, as there are thousands of acres of lead-bearing rock which have not yet been touched, there is no prospect of Missouri losing its importance in this respect.

Third in importance in the mineral industries of the State is coal mining, which, increasing its output between 1880 and 1903 from 844,304 tons to 4,238,586 tons, has been comparatively stationary in the past seven or eight years. In forty-five counties in the northern and western parts of the State are more than 16,000 square miles underlain with coal measures from which nearly 110,000,000 tons have been taken, but which contain 40,000,000,000 more tons.

The fuel is there in quantity sufficient to last 10,000 years at the present rate of mining, which is retarded for two reasons. With Iowa, Arkansas, Oklahoma, Kansas, Illinois and Kentucky close at hand to supply the cities of the State near the boundaries, the demand for Missouri coal is limited largely by local markets, and does not come in competition with the coals of other States. But the greater influence has been the increase in the use of petroleum and natural gas for fuel, either from the State fields or from other sources in the mid-continent field. Southeast of Kansas City is an area of about thirty square miles containing oil wells, and within the same area or adjacent to it is natural gas; but Kansas and Oklahoma are looked to for the supply of both these materials, although it is believed that the development of natural gas in Missouri has really only begun.

Advantage has been taken of the vast deposits of clays, and the State ranks seventh in the United States in the value of clay products. In 1911 that amounted to \$6,274,353, of which \$1,763,548 represented fire-brick, the region about St. Louis being one of the greatest centers of the world in the manufacture of fire-brick; \$1,309,164 represented 217,466,000 common brick, \$488,299 represented 44,813,000 vitrified brick, \$330,332 represented 25,491,000 front brick, \$1,156,626 represented sewer pipe, and \$123,499 fireproofing, hollow building tile, etc.

Four plants produced 4,114,859 barrels of Portland cement in 1911, cement materials not being the least of the State's mineral resources, and large cement plants being near St. Louis and Kansas City and at Hannibal and Cape Girardeau. The State has an abundance of shale, limestone, silica, alumina and iron oxide fit for the manufacture of high-class Portland cement, and it is estimated that in some counties the supply of such materials is so great that they would hardly be visibly affected by fifty years' drawing upon them at the present rate. Ninety per cent. of the State's stone production is limestone, although granite and sandstone are also produced, and the principal quarries are in Greene, Jackson and Jasper counties in the west and in Cape Girardeau, Marion and St. Louis counties in the east. The limestone goes into cement manufacture or into lime making.

For many years Iron Mountain, in San Francois county, was the chief source of iron ore in the State. That deposit, however, proved less than had been

supposed, and the development of larger fields where operations could be conducted more cheaply caused a decline in the industry, and one after another the mines shut down, until there were but about half a dozen in operation. But recently there has been a revival, the production having reached 113,012 tons in 1905 and 111,708 tons in 1907, and greater interest is now taken in the deposits of various grades of ore, chiefly red and brown hematite varieties, which are found in the greater portion of South Missouri. Active efforts are being made to develop the iron industry of the State on a larger scale. Other mineral products are copper, gems, mineral paints, mineral waters, pyrites, silver, sand and gravel.

New processes for the manipulation of minerals are constantly being devised, and they will no doubt have the effect of stimulating the full utilization of such resources in Missouri. Meanwhile, the door of opportunity for home-seekers and investors opens in other directions.

Of the total land area of the State, nearly 75 per cent., or 34,516,000 acres, are in farms. But of the farm land only 24,528,000 acres, or 71 per cent., are under cultivation. Ten million acres are thus still potential arable lands, while about 2,000,000 more acres of wet land, lying principally in the southeastern part of the State, are to become highly productive as soon as comparatively cheap drainage lets in the light and air to the soil. Extensive drainage projects in that region are already under way contemporaneously with a clearing of timber lands, and thus the attractions for farmers, horticulturists, stock raisers and dairymen are being added to. The nearly \$50,000,000 brought to the State in the sale of poultry, eggs and feathers can easily be doubled; the reputation of the Missouri mules, as widespread as Africa, Australia and South America, is an incentive to raising many more of them; a nursery business in the country districts alone of more than \$1,500,000 annually, and more than 1,000,000 crates of strawberries shipped a year are suggestions of the lines to be profitably followed in agriculture.

None of the manufacturing industries may be said to be overdone, and many of them are merely in their incipency. Such, for instance, is cotton manufacturing. In the season ended August 31, 1912, Missouri raised 93,042 bales of cotton, and consumed only 19,689 bales. The use of the fiber at home in manufacturing by no means approaches the use of the by-product—the seed. Most of the State's cotton is shipped to the New England mills, but the contention is made quite properly that more of it should be manufactured in St. Louis, with added supplies from Texas, Oklahoma, Arkansas and Louisiana.

The full utilization of the State's water-powers, involving the construction of storage basins, will undoubtedly give a tremendous impulse to the manufacturing energies of Missouri and help to maintain the balance of manufacturing, mining and agriculture which has already given the State its great importance in trade and commerce, reflected in the fact that it has \$403,753,798 resources in its National banks and \$451,463,808 of individual deposits in all its financial institutions.

### MISSOURI SUMMARIZED STATISTICALLY.

#### Land Area, 68,727 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	2,168,380	2,679,185	3,106,665	*3,330,000
Manufactures: ‡				
Capital .....	\$72,508,000	\$189,559,000	\$249,889,000	†\$442,343,000
Products—value .....	\$165,386,000	\$324,562,000	\$385,493,000	†\$574,111,000
Cotton Mills:				
Spindles active.....	19,312	6,670	13,654	42,016
Looms active.....	431	110	300	968
Cotton used, pounds.....	3,082,188	1,080,540	2,171,000	9,701,041
Cottonseed Oil Mills:				
Products, value.....	\$140,000	.....	.....	†\$648,000
Pig-iron made, tons.....	94,246	89,777	**	**
Coke made, tons.....	.....	6,136	2,087	.....
Lumber cut, feet.....	399,744,000	395,755,000	723,754,000	†418,586,000
Improved farm lands, acres.....	16,745,031	19,792,313	22,900,043	\$24,528,000
Farm lands, buildings, value.....	\$375,633,307	\$625,858,361	\$843,979,213	\$81,710,505,000
Agricultural products, value.....	\$95,913,000	\$109,751,000	\$219,297,000	*\$411,625,000
Cotton crop, running bales.....	21,685	16,941	20,366	*90,000
Grain, bushels:				
Corn .....	160,463,000	175,345,000	180,710,000	243,904,000
Wheat .....	29,563,000	17,638,000	18,847,000	23,932,000
Oats .....	25,314,000	24,579,000	24,695,000	33,264,000
Livestock:				
Cattle .....	2,072,000	2,955,710	2,979,000	2,326,000
Sheep .....	1,411,000	950,562	1,087,000	1,755,000
Swine .....	4,553,000	4,987,432	4,525,000	4,491,000
Mineral products, value.....	\$4,736,280	\$13,794,930	\$13,407,664	*\$54,000,000
Coal mined, tons.....	844,304	2,735,221	3,540,103	*3,800,000
Iron ore mined, tons.....	344,819	181,690	41,366	*75,000
Petroleum, barrels.....	.....	278	1,602	3,000
Railroad mileage.....	3,965	6,142	6,887	8,232
National Banks:				
Resources .....	\$22,620,287	\$100,428,159	\$179,746,530	\$403,753,798
Capital .....	\$7,200,000	\$22,160,670	\$17,950,000	\$36,215,000
Individual deposits.....	\$8,391,274	\$45,011,219	\$64,448,555	\$147,298,089
Other banks, deposits.....	\$33,995,915	\$68,007,841	\$88,660,622	\$304,165,719
Common school expenditures.....	\$2,675,364	\$5,434,262	\$7,816,050	\$813,067,000
Property, true value.....	\$1,562,000,000	\$2,397,903,000	\$3,244,500,000	*\$4,544,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910. \*\*Included in Georgia.

# MISSISSIPPI

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories . . .</b>	<b>\$7,518,000</b>	<b>\$18,706,000</b>	<b>\$40,431,000</b>	<b>\$100,000,000</b>
<b>Farms . . . . .</b>	<b>\$63,702,000</b>	<b>\$73,343,000</b>	<b>\$102,492,000</b>	<b>\$174,830,000</b>
<b>Forests . . . . .</b>	<b>\$3,200,000</b>	<b>\$10,086,000</b>	<b>\$26,093,000</b>	<b>\$60,633,000</b>
<b>Mines . . . . .</b>	<b>\$40,000</b>	<b>\$301,000</b>	<b>\$622,000</b>	<b>\$1,000,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



MISSISSIPPI, lying between 30° 13' and 35° north latitude, has a maximum stretch of 227.7 miles north and south, reaching from the Gulf of Mexico to the southern boundary of Tennessee, and has an area of 46,865 square miles. Of its 29,671,680 acres only about 8,000,000 are improved, leaving an immense area of extremely fertile lands to be brought under cultivation. Outside of the broad bottoms of the Mississippi on the west, the State has a rather hilly contour, though few of the elevations rise above 150 to 200 feet, and none more than 900 feet. The land is, therefore, for the most part of a smooth and rolling character, a very large proportion being susceptible of cultivation.

The soils are divided into five divisions—the Mississippi bottom, the bluff formation, the yellow loam region, the prairie region and the pine woods region. The Mississippi bottoms embrace the plain that lies back of the bluffs that follow the Mississippi River and rolls back with varying width to the foot of the hill region. They cover the famous Yazoo Delta lands, through which the Yazoo River runs to the Mississippi. This delta is 180 miles long and about 75 miles wide at its widest point, and has an area of 7000 square miles. Much of this delta was formerly subject to overflow, but latterly the water has been excluded by levees, and it has now become one of the most sought of Southern regions by agriculturists looking for lands of high fertility. The soil of this region is loam, with a clay subsoil, easily worked and highly productive. The bluff division is along the river and extends for an average distance of 12 miles east. The soil of this region is naturally highly fertile and produces almost any crop known to American agriculture. The yellow loam region extends from the Tennessee line well down toward the center of the State, and from the western boundary of Alabama to the alluvial lands of the Yazoo and Mississippi Rivers, covering an area of more than 10,000 square miles. The surface of this division is generally hilly, though it becomes almost level toward its southern boundary. This region is watered by many streams, and is generally fertile and easily tilled. The prairie region lies in irregular shape, embracing a very large area along the eastern border of the State, and throughout the counties of Kemper, Noxubee, Lowndes, Oktibbeha, Clay, Monroe and Chickasaw. The lands are usually level, or gently rolling, and the soils, dark, heavy, calcareous, frequently consisting of clay marls or rotten limestone, are naturally extremely rich. The pine woods region covers a large portion of the southern section of the State and, though the soil is light and was for years held to be infertile and practically useless, it can be made highly productive with proper treatment, yielding readily as it does to the influence of fertilizers properly applied. These pine lands have proved of high value in the production of fruits—figs, oranges, peaches, pears, grapes, strawberries and some varieties of summer apples. Wheat, buckwheat, corn, barley, rye, upland rice and sugar cane can all be grown with profit upon the soils of this region where given the necessary attention.

Mississippi has long been a distinctively agricultural State and still is, owing to the extremely fertile character of its soil and the ease with which it can be worked. It is claimed for the delta region that it produces more cotton to the acre than any other general section of the cotton-producing country, while the lands throughout practically the entire State make good crops of that great Southern staple. Corn also makes a good crop in all parts of the State, and with more modern methods of cultivation which have been introduced there, as elsewhere in the country, the yield of that cereal will doubtless be largely increased. Mississippi has, in fact, been a large purchaser of corn in the past, while depending upon cotton to bring money to its farmers, a bit of false agricultural economy that is now being superseded by crop diversification, and the production upon the farm of practically all the things used on the farm that can be grown there.

Another branch of farming to which much attention is now being given by the Mississippi agriculturist is the raising of grasses and forage crops. Formerly that portion of the farm given over to grass was considered by many farmers as merely wasted; now the meadow land is recognized as among the most profitable portions of the plantation. All the best grasses are grown in

some parts of the State, and some of them are produced in all. The clovers, the vetches, alfalfa, cow peas, soy beans, crab grass, Johnson grass, Bermuda, melilotus, herds grass and many others flourish wherever given the opportunity. Oats and rye are in general use for cover crops and winter pasturage, and oats have also been found to produce well of grain where given the opportunity to mature. Wheat, though never cultivated to any very great extent, has been found to bring forth abundantly in portions of the State, and yields of from 30 to 50 bushels per acre are not uncommon. The attention paid to these grain and grass crops has been found profitable, not only by reason of the saving made in securing the necessary supplies of food and forage, but also because of the refertilization they bring to soils sadly worn by overmuch planting to a single crop.

Another branch of husbandry that has received a considerable impetus from the growing of grains and grasses is stock raising. Where formerly many thousands of dollars were sent from the State each year to purchase horses and mules for the plantations, and even to secure the bacon necessary to feed those carrying on the work, the farmers of Mississippi are now turning a large part of their attention to the growing of live stock, and it will probably not be many years before the State becomes a seller rather than a buyer of work stock, cattle, hogs and sheep. The introduction of high-bred cattle into the State, and the practical demonstration of the low cost at which they can be bred and prepared for market, have been the means of causing many farmers to engage in the live-stock business as a valuable "side line" to their general farming operations. The ease with which rich, nutritious grasses can be produced in all sections of the State, and the fact that the climate permits stock to graze throughout the entire year, combine to make Mississippi one of the best of cattle-producing States, and it is undoubtedly but a question of time, and that short, when each farmer will make it a rule to have for market each year a greater or less number of fat cattle. Already the packing-house business has been put to trial in Mississippi, and a local market thus established for the product of the pastures of the State. The numerous cottonseed mills in various sections furnish the hulls and meal necessary to top the animals off for the market. Dairying goes hand in hand with the cattle business, and already this has proved a gratifying success where given a trial in Mississippi. Markets for such products are easily reached by means of the railroads that penetrate every portion of the State, and nothing but effort is needed to put the dairy business upon a firm commercial footing.

Possibly nowhere else in the country can pork be produced more cheaply than in Mississippi. With a climate that allows the animal to care for himself throughout all the months of the year and with grasses and forage crops that make grain feeding unnecessary, the Mississippi farmer turns his pigs into the open fields and a few months later goes out and drives in hogs ready for the slaughter pen. Recently the farmers, especially those of the rich Delta district, have been paying much more attention than formerly to the raising of hogs, and those who have secured well-bred stock and have engaged in the business with careful intelligence have found it to pay more, possibly, for the labor and money invested than any other part of their farming enterprises. Peanuts, chufas and other crops are planted in some portions of the State especially for hogs, which are turned into the fields to root out their own living. From such fields they are taken direct to the market without further feeding.

Farmers who have devoted their time to raising sheep have also found profit in that branch of the stock business. Especially has there been success achieved in the prairie belt of Eastern Mississippi, where the grasses have been found to be especially good for sheep. The mild climate has proved of the highest benefit to lambs, a large percentage of which are saved. The production of early spring lambs for the market has been found profitable. The poultry raiser finds Mississippi an almost ideal section in which to follow his calling. The mild winters, the long laying season and the wealth of grasses and other things which nature provides for fowls to feed on all make for



economy in the poultry yard. A large amount of poultry goes from Mississippi to supply the demand in Florida during the tourist season, and big shipments are made also to the West Indies and Central America.

Truck crops of all kinds are successfully grown in all sections of Mississippi, and the trucking business is growing to large proportions in a number of places. The product goes to all the Southern cities and to a large number of Northern points as well. The principal crops grown are Irish and sweet potatoes, cabbage, beans, tomatoes, peas, onions, lettuce, okra, cauliflower, cucumbers, radishes, turnips, eggplant, kale, spinach—practically all the vegetables grown for table use. Irish potatoes yield from 100 to 200 bushels to the acre and sweet potatoes from 100 to 250 bushels. Tomatoes easily produce crops valued at from \$300 to \$500 per acre. Watermelons and canteloupes grow in great abundance and are sent by the train load from the points of assembly to the various markets. In size and flavor the melons are equal to the best produced in any other section.

Sugar cane makes a good crop in some sections, and a good many farmers make satisfactory profits from raising cane and making syrup. Broom corn also yields abundantly. Tobacco grows well, and in the southern part of the State the Cuban and Sumatra leaf is successfully produced. Barley is grown successfully in some places. Peanuts are grown to a large extent in some portions of the State, though they are planted as food for hogs in most. In some sections the nut is harvested, and the yield is found to be large. In some portions of the State honey producing has been found profitable and a considerable interest has sprung up in bee growing.

Fruits of practically all kinds are grown in Mississippi. Oranges and figs are cultivated to a considerable extent in the southern portion, and considerable profit has been made from them. Peaches produce well in practically all portions, and instances of great profit from peach orchards are numerous throughout the State. In those sections in which the lighter soils prevail, the growing of peaches is becoming an important industry. Summer apples have been grown with profit in numerous places, and very good winter apples have been produced on the higher ground. Strawberries, grapes and other small fruits yield abundantly in all sections.

Practically the entire State of Mississippi was formerly heavily timbered and there is yet a very large area of virgin forest. Pine, cypress, gum, the oaks, cottonwood, ash, poplar, elm, hickory, chestnut, pecan and other varieties of merchantable woods abound, and hundreds of sawmills, giving employment to thousands of men, are engaged in turning large quantities of this timber into lumber each year. The output of the mills of the State now totals more

than 2,000,000,000 feet annually. Of recent years the manufacture of tight-barrel staves has become an important part of the lumber business of Mississippi by reason of the fact that its forests furnish large amounts of the high-class oaks necessary to their manufacture.

While not classed as a mineral State, Mississippi has a very considerable number of valuable mineral deposits, including clays suitable for pottery, brick, tile, terra cotta and other refractories; limestones, some of which possess the elements necessary for making high-grade hydraulic cement, as well as for the manufacture of lime; building stones of various kinds; kaolin, gypsum, ochre, fullers' earth, chalk, white sands, declared to be suitable for making glass; marls of various kinds, and in great abundance. There are also large deposits of lignite, extending over an extensive area.

In manufacturing the making of lumber and lumber products leads in number of people employed and value of output. Woodworking plants, to turn rough lumber into its finished products—furniture, barrels, boxes, crates and many other things made of wood—find in Mississippi excellent opportunities for profitable operation. There is much timber to be had at low prices, the transportation facilities are excellent, and every element necessary for success seems to conspire with every other such element to invite the investment of capital in such enterprises.

The textile industry has been introduced into the State, and at Meridian, West Point, Columbus, Starkville, Stonewall, Winona, Corinth, Aberdeen, Tupelo and other places cotton mills are now being successfully run. There are cottonseed-oil mills at numerous places. Clay-working industries of various kinds are being carried on at several points in the State, and meat packing in at least one. This latter is a most important departure, for with the rapid development of the live-stock industry which seems destined to take place and the constantly growing local demand for packing-house products, there seems nothing in the way of success in such undertakings.

Mississippi is paying more attention each year to the development of its public school system, which is rapidly advancing in excellence and usefulness. It has a high-class university at Oxford and an excellent agricultural and mechanical college at Starkville, where scientific instruction in agriculture and the useful mechanics is given to the young men of the State. A normal school for the instruction of teachers is maintained, and at Columbus years ago was established the State Industrial School for Girls, the pioneer school of its kind in the country established and kept up at State expense. Agricultural experiment stations are also maintained by the State, and those who desire are given the benefit of instruction in the most modern methods of agriculture.

#### MISSISSIPPI SUMMARIZED STATISTICALLY.

##### Land Area, 46,362 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,131,597	1,289,600	1,551,270	*1,845,000
Manufactures: †				
Capital .....	\$4,728,000	\$14,897,000	\$35,807,000	†\$72,393,000
Products—value .....	\$7,518,000	\$18,706,000	\$40,431,000	†\$80,555,000
Cotton Mills:				
Spindles active .....	18,568	57,004	75,122	134,646
Looms active .....	644	1,352	2,461	3,422
Cotton used, pounds .....	2,881,853	8,449,834	10,363,458	14,887,825
Cottonseed Oil Mills:				
Products, value .....	\$560,363	\$2,406,628	\$6,681,121	†\$15,469,000
Lumber cut, feet .....	168,747,000	452,797,000	1,202,334,000	‡2,041,615,000
Improved farm lands, acres .....	5,216,937	6,849,390	7,594,428	\$8,959,000
Farm lands, buildings, value .....	\$92,844,915	\$127,423,157	\$152,007,000	\$8330,295,000
Agricultural products, value .....	\$63,702,000	\$73,343,000	\$102,492,000	*\$174,830,000
Cotton crop, running bales .....	963,111	1,154,725	1,257,772	*1,150,000
Grain, bushels:				
Corn .....	23,218,000	24,396,000	25,232,000	56,840,000
Wheat .....	281,000	286,000	41,000	96,000
Oats .....	3,021,000	4,778,000	2,390,000	1,966,000
Livestock:				
Cattle .....	655,000	819,201	873,000	1,009,000
Sheep .....	288,000	451,779	313,000	214,000
Swine .....	1,152,000	1,163,141	1,290,000	1,577,000
Mineral products, value .....	\$40,000	\$300,959	\$621,985	*\$1,000,000
Railroad mileage .....	1,127	2,471	2,934	4,316
National Banks:				
Resources .....		\$4,641,451	\$6,557,164	\$25,262,062
Capital .....		\$1,140,000	\$980,000	\$3,255,000
Individual deposits .....		\$1,805,955	\$3,878,626	\$13,968,915
Other banks, etc., deposits .....	\$2,634,915	\$4,321,263	\$12,547,103	\$50,910,873
Common school expenditures .....	\$830,705	\$1,109,575	\$1,385,112	\$82,726,000
Property, true value .....	\$354,000,000	\$454,243,000	\$557,600,000	*\$1,000,000,000

\*Partly estimated. †Not including neighborhood industries and hand trades in 1909. ‡Figures of 1909. §Figures of 1911. ¶Figures of 1910.

# NORTH CAROLINA

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	\$20,095,000	\$40,375,000	\$94,920,000	\$260,000,000
<b>Farms.....</b>	\$51,730,000	\$50,071,000	\$89,310,000	\$188,901,000
<b>Forests.....</b>	\$4,455,000	\$12,675,000	\$24,771,000	\$49,745,000
<b>Mines.....</b>	\$576,000	\$837,000	\$1,459,000	\$2,600,000

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



**N**ORTH CAROLINA, with its infinite variety of climate, soil, natural resources and acquired advantages, has an area of 52,426 square miles, of which water covers 3686 miles. It lies between 34 degrees and 36½ degrees north latitude, and between 75½ degrees and 84¼ degrees longitude west from Greenwich. Its greatest length is from northeast to southwest, a stretch so long that a circle drawn with it as the radius and the northwest corner of the State as the pivot would take in Buffalo, N. Y.; the whole State of Pennsylvania, Ohio, Indiana and a large part of Illinois in its sweep. Its reach north and south is from the southern end of Virginia to about the middle of South Carolina; from east to west it extends from the Atlantic Ocean at the farthest southeastern point of the country to a point considerably west of the eastern extension of Tennessee. Its topographic variety, from sea level on the east to an altitude of nearly 7000 feet on some of the mountain tops at the west, gives it a climatic variety not possessed by many States, ranging from semi-tropical on the islands off the coast to the temperature of Northern Canada on the tops of its high mountains.

North Carolina has three distinct divisions—Mountain, Piedmont and Coastal Plain. The first stretches along the western border, touching on Tennessee from Virginia to Georgia, taking in a number of counties, in some of which the Appalachian mountains reach their greatest altitude in the peaks of the Blue Ridge and the Great Smoky mountains. The Mountain district is about 100 miles wide and has an area of about 6000 square miles. The Piedmont plateau, joining the Mountain section on the east, covers about one-third the area of the State. It is divided into the Upper and Lower Piedmont, the former having an elevation of from 1000 to 2000 feet below that of the adjoining Mountain region. In the Lower Piedmont the elevation gradually declines until the level of the Coastal Plain is approximated. The surface is generally rolling. The Eastern division is the Coastal Plain, which reaches from the edge of the Lower Piedmont to the Atlantic Ocean. It is for the most part a level country, though slightly rolling toward its western limits.

The soils are as varied as the climate, running from the sand of the sea-coast and the rocky covering of the mountain peaks through clays, loams and alluvia to the rich black muck that decayed vegetation has left on the broad savannas that dot the Coastal Plain, and in the numerous swamps that furnish the richest, most fertile lands. It is a remarkable fact that except where destroyed by erosion the soil on most mountain ranges is rich and deep—the mountains of this State, even to their summits, being generally covered with heavy timber. The products are as varied as soil and climatic variations multiplied together, covering the wide range from north temperate to semi-tropical, from the wheat, the apples and the winter potatoes of the higher altitudes to the Sea Island cotton, the figs and the early vegetables of the low-lying coast country, whose seasons are influenced by the warm sweep of the Gulf stream.

The acreage of North Carolina totals 31,193,600, of which amount but 9,000,000 acres can be classed as improved farm lands, and many acres so classed are not utilized, while there is a vast area of 14,000,000 acres upon which no agricultural improvements have been made, but which should, and doubtless will, be turned into farms, orchards and cultivated pastures, to the profit of the individual owner and the Commonwealth. Although agriculture has from the beginning formed the chief industry of the people, the possibilities of the State in that respect have been developed to a very small degree as compared with their extent. In the last few years the farmers of the State, by the adoption of scientific and intensive methods, have been gradually advancing their business to a higher and more profitable plane. As scientific methods of culture are adopted by the more progressive of the agriculturists, the advantages accruing from them are becoming more and more impressed upon the people at large, and each year sees an advance beyond the accomplishment of the year before. The State, with a well-equipped and well-conducted college of agriculture, many farmers' institutes and constant instruction in the common schools, is doing a broad educational work along this line, and the effect is seen in largely increased yields per acre and a generally improved spirit among the agricultural classes. There has been much improvement in stock, more attention is being given the dairying business, poultry-raising is being extensively and profitably engaged in by many people, and there is promise of continued rapid advance in the whole realm of agriculture.

In North Carolina, as in most other Southern States, cotton occupies first

place in extent of cultivation and value. The crops of the State for 1912 aggregated something like \$150,000,000, of which the cotton crop made about one-third. Following cotton came corn, worth approximately \$42,000,000; tobacco, wheat and oats, hay and provender crops. In corn a yield as high as 226 bushels an acre has been made, while yields of 50 to 75 bushels are common. In wheat a yield as high as 50 bushels has been authenticated, and some oats have run from 60 to 75 bushels. In the lowlands of the eastern section rice is grown and was once a very important crop, while rye, barley and buckwheat grow prolifically in the highlands of the western section. Broom corn makes a big yield and would prove a profitable crop if properly cultivated. Peanuts are being raised in continually increasing quantities. In the sandy loam soils they yield well and are found to be quite profitable. They are valuable for the nuts, which command a good price, and for the vines, which make excellent forage for stock.

A large trucking industry has been developed in various portions of the State, but more especially in the coast region, where every variety of edible vegetable is grown, and the business has been found highly profitable. Irish potatoes, sweet potatoes, tomatoes, lettuce, cabbage, spinach, string beans, lima beans, peas, onions, celery, asparagus, beets, cauliflower, peppers, eggplant, cucumbers, canteloupes, watermelons—in fact, all truck crops are grown in great abundance. To these may be added strawberries, blackberries, raspberries and grapes. The section about Wilmington has become of great prominence in the cultivation of strawberries, the product of last year reaching approximately 1600 carloads. Truck growers who are diligent in cultivation and intelligent in marketing their crops have made fortunes in the Wilmington section, and others are still making fortunes. A half acre of lettuce, raised under cover last spring, brought its owner \$1800, of which more than \$1300 was net profit. A grower who planted 13 acres to lettuce one year sold his crop for \$12,000. Early potatoes are grown with profit in the low, warm soils of the coast section, while in the colder soils of the highlands winter potatoes produce bountifully, and of the best quality. The truck from North Carolina gets into the Northern markets between the last of the Florida crop and the first of that from points farther north, and commands good prices.

Few sections have so many elements that make for success in apple growing as the Southern Appalachian region, and the North Carolina counties that lie in that region are rapidly taking high rank in the production of apples of fine size, perfect coloring and delightful flavor. Only in the last few years has orcharding in a commercial way been engaged in to a large extent by the people of North Carolina, but so successful have the pioneers in the business been that thousands of trees are being set out each year, and the raising of apples promises to take its place among the most important branches of husbandry. Throughout the State generally, and more especially in the thermal belts of the mountain section, peaches yield well, growing to large size and possessing a most excellent flavor. Grapes grow in the greatest profusion all over the State, and cherries, plums, pears and quinces flourish in various localities. Figs are grown in quantities in the more southerly portions and on the coast.

In variety of mineral resources North Carolina holds a position possibly not surpassed by that of any other State. Iron, copper, gold, mica, corundum, manganese, kaolin, fire clay, graphite, granite, marble, talc, barytes, asbestos, pyrites, limestone, shales, clay for brick and tile—all have been found in commercial quantities, and most of them in numerous places. The Cranberry iron ore beds in Mitchell county are among the noted iron deposits of the country, and this ore has been utilized in making iron for many years. Other deposits of very high-grade ores are found in the western part of the State, and it is believed that eventually as the mountain region is opened up by new railroads, North Carolina will become an important iron-ore producer. Some of the most important granite quarries in the country are located in North Carolina, and their product is shipped into many States. Kaolin is mined at numerous points for use in Northern potteries. Talc, barytes, fire clay and the cement compounds are produced in various places. The brick and tile and fire clays are mined and utilized in numerous localities. Gold has been mined in varying quantities for many years. Diamonds have been found in the State, and of agate, beryl, garnet and other semi-precious stones there are large quantities. In variety of minerals North Carolina is probably not surpassed by any other equal area of this or any other country.

Large bodies of timber still stand in North Carolina—pine, cypress, gum



and juniper in the eastern portion and among the swamps; the oaks, poplar, spruce, hemlock, white pine, chestnut, ash, maple, walnut, cherry, beech, hickory and the other hardwoods on the Piedmont plateau and throughout the mountain region. Hundreds of sawmills, from the band-saw type that cuts into the tens of thousands of feet daily to the portable "circle" mill that cuts but a few hundreds, abound throughout the timber regions, and their combined output approximates two billion feet annually.

In manufacturing North Carolina has made rapid strides in the past few years. The census figures show that the factory products of the State, which in 1905 aggregated in value \$143,000,000, had grown in four years, or by 1909, to \$216,656,000, an increase of about 50 per cent. Since then the progress has been even more rapid. First in importance is cotton manufacturing, which employs more than 60,000 looms and more than 3,500,000 spindles, North Carolina ranking as one of the leading cotton manufacturing States of the South, its mills generally consuming more cotton than the State produces. The making of furniture has been developed to a high degree, and there are approximately 150 factories engaged in that class of industry. Every branch of the business is represented, and the capital employed, as well as the value of the annual output, runs far into the millions of dollars. North Carolina-made furniture is shipped as far west as the Pacific coast and as far east as Africa. The tobacco manufacturing business, centering largely about Durham and Winston-Salem, is a very important one, and represents many millions of dollars in capital and yearly product. There are large tannic acid plants in the mountains, and one of the largest pulp mills in the country is at Canton. Many cottonseed mills are located at various points in the cotton sections, North Carolina having been one of the leaders in the development of this industry. There are several large tanneries, and North Carolina has reached an important place in the leather-making business of the country. The number of people employed in manufacturing throughout the State approximates 134,000.

The harbors on the coast and the rivers that lace the lands give North Carolina great natural facilities for transportation, and these have been supplemented by trunk line railroads entering the State from north, south and west, and many smaller lines running from point to point within its borders. These enable the producers of agricultural and manufactured articles to reach all the markets of this country and foreign lands with convenience and dispatch. The rivers, flowing down from the mountains, present many opportunities for the development of power in large quantities, some of which have been utilized, but there are many great power sites not yet developed. French capitalists recently bought a large power development which had been halted for lack of capital and will spend about \$10,000,000 in completing the plant and building a great aluminum factory. The Southern Power Co., with headquarters at Charlotte, has expended about \$10,000,000 in developing several hundred thousand hydro-electric power in North and South Carolina, and the same interests are spending probably equally as much in building an interurban electric railway of the most modern construction, connecting many of the leading towns and cities of the Piedmont section of the two States, and equipped for heavy freight as well as passenger traffic.

North Carolina has a large area of wet lands, requiring drainage to make them productive, and in numerous counties drainage districts have been

formed for their development. These lands are very fertile after being rendered sufficiently dry for cultivation, and their reclamation will add largely to the agricultural wealth of the State. Very extensive drainage operations are now under way reclaiming land of exceeding fertility.

North Carolina has a public school system embracing schools of all grades, from the State University to the elementary grades. It has schools of agriculture and technology that are doing excellent work in teaching practical things.

The mountains of the western portion of the State have many resorts to which people from farther South come in summer for the atmosphere of the higher altitudes, and people from the North come in winter to escape the rigorous cold of their homes. Especially in the thermal belt of the mountain district is the winter climate soft, pleasant and invigorating. The Asheville region is becoming one of the most noted resorts of America. The "Land of the Sky" and the "Sapphire Country" are among the fanciful names bestowed upon the mountain sections of the State, in the former because of the rare beauty of sky and forests and mountain heights, and in the latter case doubtless from the rich mineral region of corundum and sapphires in that vicinity.

Near Asheville, in Buncombe county, George Vanderbilt of the famous family of multi-millionaires years ago established an estate which he calls "Biltmore," a vast domain of 100,000 acres, of which 8000 or 10,000 acres are devoted to what is known as his farm property, and the remainder is timber land. There Mr. Vanderbilt has what is regarded by many people as the most palatial estate in America, and he has introduced scientific methods of agriculture, arboriculture, dairying and stock-raising that have been of great benefit to that section, a benefit that is spreading out over the entire State. He has introduced into the State a great many kinds of high-bred stock, and the development of Biltmore has been of value to North Carolina in numerous ways.

In the mountain section there are, it is said, 50 or more peaks of 5000 feet or over in elevation. This mountain region is destined to become one of the greatest health and pleasure regions of the world. But it has such vast and varied resources of minerals, timbers, water-powers and agricultural advantages that it will also become one of the great centers of industrial and agricultural activity of the nation.

Excellent lands can be purchased at low prices in practically every section of the State, and every encouragement is given the man who enters North Carolina to engage in agricultural or industrial pursuit of any kind.

The material progress of North Carolina finds expression in advancement in every line of human endeavor, in educational and religious activities, in good-roads building, in agriculture and manufactures, and in the broader development of the splendid health and pleasure opportunities presented by its coast and mountain resorts.

In 1880 North Carolina had only \$20,095,000 as the value of its manufactured products and \$51,730,000 as the value of its agricultural products. By 1900 manufactured products had more than quadrupled. In 1912 the value of manufactured products was thirteen times as great as in 1880 and the value of agricultural products was three and a half times as great. In 1880 agriculture exceeded factory work measured by value of products by \$31,000,000, while by the same standard of measure manufactured products in 1912 exceeded agriculture by \$71,000,000.

#### NORTH CAROLINA SUMMARIZED STATISTICALLY.

Land Area, 48,740 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,399,750	1,617,949	1,893,810	*2,270,000
Manufactures: ‡				
Capital .....	\$13,046,000	\$32,746,000	\$76,504,000	†\$217,186,000
Products—value .....	\$20,095,000	\$40,375,000	\$94,920,000	†\$216,656,000
Cotton Mills:				
Spindles active .....	92,385	337,786	1,134,909	3,393,793
Looms active .....	1,790	7,254	25,469	59,995
Cotton used, pounds .....	11,832,641	53,546,289	190,138,759	391,079,508
Cottonseed Oil Mills:				
Products, value .....		\$529,900	\$2,676,871	†\$6,199,000
Pig-iron made, tons .....		2,841	**	**
Lumber cut, feet .....	241,822,000	509,436,000	1,278,399,000	†1,798,724,000
Improved farm lands, acres .....	6,481,191	7,828,569	8,327,106	\$8,800,000
Farm lands, buildings, value .....	\$135,793,602	\$183,977,010	\$194,655,920	\$455,715,000
Agricultural products, value .....	\$51,730,000	\$50,071,000	\$89,310,000	*\$188,901,000
Cotton crop, running bales .....	389,598	336,261	477,070	*965,000
Grain, bushels:				
Corn .....	36,954,000	36,264,000	29,790,000	51,106,000
Wheat .....	4,871,000	3,156,000	5,961,000	5,322,000
Oats .....	5,515,000	6,198,000	5,046,000	3,794,000
Livestock:				
Cattle .....	607,000	572,711	625,000	692,000
Sheep .....	462,000	402,247	302,000	193,000
Swine .....	1,454,000	1,251,006	1,300,000	1,405,000
Mineral products, value .....	\$575,679	\$836,769	\$1,458,848	*\$2,600,000
Coal mined, tons .....	350	10,262	17,734	.....
Iron ore mined, tons .....	2,963	22,873	**	*\$66,000
Railroad mileage .....	1,486	3,128	3,733	5,574
National Banks:				
Resources .....	\$8,420,060	\$10,025,041	\$15,362,182	\$65,716,876
Capital .....	\$2,501,000	\$2,656,000	\$3,043,500	\$8,660,000
Individual deposits .....	\$2,883,366	\$4,673,294	\$7,477,058	\$34,566,493
Other banks, deposits .....	\$1,596,632	\$3,367,909	\$9,280,798	\$49,133,125
Common school expenditures .....	\$376,062	\$714,900	\$950,317	\$83,038,000
Property, true value .....	\$461,000,000	\$584,149,000	\$682,000,000	*\$1,127,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910. \*\*Included in Georgia.

## OKLAHOMA

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
Factories.....		\$429,000	\$10,976,000	\$65,000,000
Farms.....		\$440,000	\$73,120,000	\$229,953,000
Forests.....		\$115,000	\$421,000	\$7,436,000
Mines.....	\$170,000	\$785,000	\$2,563,000	\$40,000,000

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



OKLAHOMA, lying for the most part between 34° and 37° north latitude and 94° and 103° west longitude, has an area of 70,057 square miles, 44,424,960 acres. It is located entirely within the Mississippi valley. Its principal streams are the Arkansas and Red Rivers, both of which flow into the Mississippi. The Arkansas takes its rise in the Rocky Mountains in Colorado, and enters Oklahoma through Kansas, flowing in a general southeasterly direction, crossing the eastern boundary of the State near the center. Its chief affluents in Oklahoma are the Verdigris, the Grand, or Neosho; the Salt Fork, the Cimmaron, the two Canadians and the Poteau. The principal tributaries of the Red River in Oklahoma are the Salt Fork, the North Fork, the Cache, the Washita, the Boggy, the Kiamitia and the Little River. All these rivers, as a rule, flow east and southeast. The elevation of Oklahoma is from 400 feet in the Red River valley to more than 5500 feet on the mesa in the extreme northwestern part of the State.

The soils are wonderfully variant in character and no less wonderful in natural fertility. A portion of the west is included in the Great Plains region that runs through Western Texas, the contour of which is very smooth, and the soil surpassingly rich. Eastward from the Great Plains section lies the prairie section, where the lands, though more rolling in character, are no less rich. In the central portion there are considerable areas of woodland, and as the eastern boundary is approached the forest growth becomes more pronounced, though there are throughout the entire region many reaches of open prairie land. The uplands of the wooded areas have a sandy soil as a general thing, which, though having a fair degree of fertility, are much more easily exhausted than the heavier soils of the prairie region. Here and there across the entire State occur the great alluvial valleys of the principal rivers—known as the "Nine Niles of Oklahoma"—and the many creeks. These are all covered with a rich soil, created by ages of silt deposits and decaying vegetation. The underlying cause of the variant character of the soils of Oklahoma is found in the variety of basic rock formations. These cover granite, limestone, sandstone, gypsum and rock of volcanic origin.

A number of mountain ranges are found in the State. The Ozarks come over the eastern boundary into the Cherokee country. To the south, in the old Choctaw territory, are the Ouachita Mountains, including the Poteau, the Winding Stair and the Kiamitia ranges. West of these, in the section formerly held by the Chickasaws, are the Arbuckle Mountains and farthest west of all, in the Comanche and Kiowa country, are the Wichita ranges, forming a striking feature of an otherwise level plain country.

The climate of Oklahoma is mild and free from extremes. The farmer finds it possible to work outdoors throughout the entire year. The heat that would naturally come from its southern latitude is moderated by its higher altitudes and the breezes that sweep over it from the mountain regions on the west. The mean average temperature for 12 years, as shown by the records of the United States Weather Bureau, is 60° Fahr. The mercury seldom drops to zero and as seldom rises above 100°. The rainfall runs from more than 40 inches in the southeastern portion to less than 20 in the extreme northwest. The rainfall is usually well distributed over the growing season. The average of clear days is more than 200 annually.

The greater proportion of the rapid immigration to Oklahoma was induced by the fertility of its soil, the smoothness of its lands, its equable climate and its general fitness for agriculture, and it has been known principally as an agricultural State, its people as an agricultural people. Owing to its climate and soil, Oklahoma can produce practically every farm crop, all the vegetables and all the fruits grown in the temperate zone. From its first settlement by whites, Oklahoma immediately sprang into prominence in the production of cotton, because of the fact that some portions of the State are so peculiarly adapted to the growth of cotton that it proved the most dependable of money crops. The rich bottom lands bordering its creeks and rivers are especially adapted to cotton, and that staple will no doubt be the

chief crop grown upon them for many years. The State has already passed the million-bale mark in annual production.

Next to cotton comes corn in importance as measured by amount and value of product. In the production of corn, Oklahoma reached very close to the 100,000,000-bushel mark with its bumper-crop of 1906. Next to corn comes wheat, of which the yield has reached in one year 25,363,000 bushels, the highest average yield per acre being 19 bushels. Of oats the State has grown 23,068,000 bushels in a single year, the average being 36.5 bushels per acre. Rye, barley and speltz are successfully grown, though their production is of secondary importance to the grains mentioned above. Kaffir corn, milo-maize and others of the non-saccharine sorghums are extensively grown in the western counties, both for grain and forage. In broom corn, Oklahoma has taken the lead of all the States. Its culture fits in well with the general scheme of diversified farming, and it has proved a good money crop for many farmers. Little of the product is manufactured locally, practically all being shipped to factories in other States.

Many species of grasses are indigenous to Oklahoma, and these have furnished pasturage for various kinds of animals, from the deer, elk, buffalo, antelope and wild horses of former days to the great herds of range cattle of a few years ago, and the short-horn and Hereford, the Holstein and Jersey, the well-bred horses and fine mules of the present day. In addition to the native grasses, alfalfa, the vetches and others of the most approved types grow in great profusion where planted, and of forage crops, such as milo-maize, Kaffir corn, sorghum, cow peas, etc., there is no section of the State in which abundant yield cannot be secured. Alfalfa farming has, indeed, come to be an industry of itself, and hundreds of Oklahoma farmers are reaping large profits from that source. From three to five crops are cut from a field each year, and as there is good sale for all that is produced the money yield per acre is very large.

The trucking crops thrive well and produce abundantly in Oklahoma. Commercial gardening has come to be an important industry within the past few years, and the product is now moved by the train load each season. Peas, beans, tomatoes, lettuce, cabbage, cauliflower, beets, radishes, onions—in fact, all the edible vegetables are grown, and those engaged in the business have found it very profitable. Canteloupes and watermelons also produce well and are grown in large quantities. Potatoes, both sweet and Irish, grow prolifically in all sections.

Orcharding is also being extensively followed in some portions of the State and most of the popular fruits do well in all parts. A number of commercial apple orchards are prospering, the fruit being of fine size and excellent flavor. Peaches develop as well in Oklahoma as anywhere else in the country, and the product is very popular in the markets to which it is sent. Pears, plums, apricots and cherries are also grown to considerable extent and all produce well. Of the small fruits, strawberries, blackberries and raspberries grow in profusion where given the opportunity, though none of them have been raised commercially to any very great extent. Many varieties of grapes are grown.

The wealth of nutritious grasses produced by Oklahoma, its many forage crops and its mild climate, combine to make it peculiarly a live-stock State. Cattle, horses and mules and hogs are all produced in large numbers, and those engaging in the business have found its various branches very profitable. Many pure-bred herds have been introduced into the State as foundations upon which to build, and the stock sent to market at this time is either of pure stock or else graded far above the old common stock. The number of sheep grown in Oklahoma is small, but those who have engaged in the business have found it profitable, and sheep growing will doubtless become of much more importance in the future.

The things that make Oklahoma a good live-stock State make it also a good dairying State, and that branch of general farming is now receiving much more attention than formerly. There are numerous creameries in successful operation in various sections at the present time, and many high-bred



milk herds are being founded. Dairy products are shipped to many outside points, as well as to the larger centers of population inside the State.

Oklahoma has a coal area of 10,000 square miles, estimated to cover 70,000,000,000 tons of coal. The coal is bituminous in character, and is of good quality for steam and domestic purposes. Mines have been operated at McAlester and elsewhere for many years, and the product is distributed generally throughout the Southwest. The output is now about 3,000,000 tons a year. The coal of Oklahoma is situated in the eastern part of the State and occurs in 12 different workable veins, some of which are 10 feet thick. The coal-mining industry is still in its infancy in the State, and will unquestionably be rapidly developed as the influx of population and the building of manufacturing plants creates a greater demand for the output.

Oklahoma is immensely rich in petroleum. The first oil well was struck in 1901 in the Red Fork district, and since that time developments have been made that have placed Oklahoma among the foremost States in the production of crude oil. The output of the State in 1911 was something more than 54,000,000 barrels. Each year witnesses the extension of the proven oil territory, and no man can tell where or to what extent it will be found as successful experimental wells continue to be put down in widely separated sections. Pipe lines have been constructed by which the crude oil is conveyed to refineries on the Missouri River and at several points in Texas.

Natural gas has also been struck in numerous places in the State, and the production is now very large. In one pool alone, near Sapulpa, in an area of five square miles, the daily capacity of the wells is more than 60,000,000 cubic feet. The gas is piped to many of the cities and towns of the State, where it is utilized for heating, lighting and the generation of power. The possession of this vast quantity of natural gas will doubtless have great effect in developing manufacturing industries of many kinds in the State, as no other fuel is so popular with manufacturers as gas where it can be secured in large quantities and at reasonable prices.

Oklahoma has many other minerals. In various sections of the State there are huge deposits of granite, in many shades of color and degrees of texture, suitable for building or monument work. It has marble of good quality and sandstones of wide variety in composition, many of which are of great value as building material. Limestone occurs in many places and is largely used for building purposes. Kilns for burning lime have been established in a number of places. Oolite, susceptible of high polish, is found in the Chickasaw nation, and porphyry and gabbro occur throughout the Wichita mountain region. Glass sand abounds in many places, and it is expected that the utiliza-

tion of natural gas will cause the development in the State of a large glass-making industry. Clays for brick making abound everywhere, and those suitable for the manufacture of tile for structural work, roofing and drainage are found in many places. The natural gas development is expected also to prove effective in connection with these deposits in developing general refractory industries.

Large deposits of gypsum are found in the western portion of the State, where it is estimated that 13 counties contain 125,000,000 tons. Some of these gypsum deposits are 100 feet thick. Gypsum cement plaster is made in a number of communities. This industry is capable of very great expansion, and will doubtless become an important one. The necessary constituents for a high-grade Portland cement lie close together in many places, affording the raw materials for a large industry.

Strong salt brine, yielding when evaporated 42 per cent. salt, flows from the ground in numerous places in the western part of the State, where it is estimated that 100 carloads of salt go to waste every day. The making of salt promises to become an important industry. Lead, zinc, copper, iron ore, tripoli, magnesia, manganese, novaculite, volcanic ash, radium and even gold and silver are found in the State, though none of these has ever been exploited to any considerable extent. Mineral waters abound in numerous places, some of them having achieved popularity as possessing medicinal qualities of great virtue.

Manufacturing industries have not been developed to a very large extent in Oklahoma, but steady progress has been made along that line. In 1890, a year after the original territory of Oklahoma was opened up to settlement, the value of the manufactured products of the State was \$429,000, whereas the output for 1912 was \$65,000,000. The possession of large quantities of cheap fuel will unquestionably cause a great growth in manufacturing during the current decade. The State has considerable available water-power also, which will have influence in developing manufacturing industries.

Oklahoma has a thoroughly modern system of public schools, at the head of which stands the State University at Norman. It has a thoroughly equipped agricultural and mechanical college at Stillwater, where young men receive practical instruction in agriculture and in numerous callings requiring both skill and knowledge. In connection with this college an agricultural experiment station is maintained. Three normal schools for the training of teachers are kept up by the State. Schools for negroes are also maintained. Each of the five civilized tribes of Indians living in Oklahoma maintains a school system of its own.

### OKLAHOMA SUMMARIZED STATISTICALLY.

Land Area, 69,414 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	76,585	258,657	790,391	*1,820,000
Manufactures: ‡				
Capital .....		\$300,000	\$5,976,000	†\$38,873,000
Products—value .....		\$429,000	\$10,976,000	†\$53,682,000
Cotton Mills:				
Spindles active .....				5,712
Cotton used, pounds .....				2,810,955
Cottonseed Oil Mills:				
Products, value .....			\$874,355	†\$5,180,000
Coke made, tons .....	1,546	6,639	38,141	
Lumber cut, feet .....		2,552,000	22,104,000	‡143,869,000
Improved farm lands, acres .....		563,728	8,574,187	\$17,496,000
Farm lands, buildings, etc. ....		\$8,581,170	\$170,804,675	\$8736,473,000
Agricultural products, value .....		\$440,000	\$73,120,000	*\$229,953,000
Cotton crop, running bales .....	17,000	34,540	212,010	*1,068,000
Grain, bushels:				
Corn .....			14,144,000	101,878,000
Wheat .....			18,657,000	20,243,000
Oats .....				23,268,000
Livestock:				
Cattle .....	546,000	125,328	3,209,000	1,746,000
Sheep .....	55,000	16,565	88,000	72,000
Swine .....		21,962	1,235,000	1,410,000
Mineral products, value .....	\$170,000	\$785,000	\$2,562,540	*\$40,000,000
Coal mined, tons .....	120,947	869,229	1,922,298	*3,200,000
Petroleum, barrels .....			6,472	52,000,000
Railroad mileage .....	289	1,261	2,399	6,461
National Banks:				
Resources .....		\$617,846	\$9,283,028	\$106,739,048
Capital .....		\$310,000	\$2,181,990	\$13,810,000
Individual deposits .....		\$229,355	\$5,262,842	\$62,445,612
Other banks, deposits .....		\$129,611	\$3,703,784	\$34,392,989
Common school expenditures .....			\$686,095	\$86,739,000
Property, true value .....	\$110,000,000	\$208,050,000	\$811,600,000	*\$1,377,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910.

# SOUTH CAROLINA

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	<b>\$16,738,000</b>	<b>\$31,927,000</b>	<b>\$58,749,000</b>	<b>\$136,000,000</b>
<b>Farms.....</b>	<b>\$41,108,000</b>	<b>\$51,338,000</b>	<b>\$68,267,000</b>	<b>\$165,791,000</b>
<b>Forests.....</b>	<b>\$3,386,000</b>	<b>\$6,118,000</b>	<b>\$8,678,000</b>	<b>\$27,789,000</b>
<b>Mines.....</b>	<b>\$794,000</b>	<b>\$3,304,000</b>	<b>\$2,451,000</b>	<b>\$1,900,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.

**S**OUTH CAROLINA, in shape a triangle, with its base resting on the Atlantic Ocean and its apex touching the mountains, lies between 32° 4' 30" and 35° 12' north latitude and between 1° 30' and 6° 54' longitude west from Washington. Its surface runs from the marshy lands of the low coastal country, through swamp lands and alluvial plains, sandy uplands and rolling highlands to the heights of the southern spurs of the Appalachian Mountains. It has an area of 30,989 square miles, 494 being covered with water. Its coast line is 190 miles in length. The State is well watered by numerous streams, and the principal rivers are navigable for varying distances, generally from the ocean to the point where the lowlands begin to merge rapidly into the hills. The freight-carrying capacity of the rivers is not much at the present time, but it is capable of being largely increased by the expenditure of comparatively small amounts of money, and will doubtless be thus increased as the demand for transportation facilities grows.

The rivers that come down from the mountains are of great value for their numerous power sites, a number of which have already been utilized for the development of hydro-electric power for use in the mills and factories of the State and some of its neighbors. Notable among these developments are those made at Great Falls, Rocky Creek, Ninety-nine Islands, Rock Hill, Anderson, Piedmont, Pacolet, Columbia, Gaston Shoals, Ware Shoals and many other points. One company has spent something like \$10,000,000 in hydro-electric development in South and North Carolina, and which has sites for developing a great deal more power, is now engaged in building an electric road of the most complete and modern kind at a cost of probably nearly \$10,000,000, to carry both passengers and freight from Greenville, S. C., to Durham, N. C., and between intermediate points throughout the Piedmont region of the two States. This will be a development of marked importance, as it will give to a rich section of the State the very best of transportation facilities. The aggregate of hydro-electric development in the State is several hundred thousand horse-power, and there are potentialities for many hundreds of thousands more.

The eastern portion of the State consists principally of a broad plain, rising gradually from a few feet above sea level to an elevation of 600 feet at its western border. The western portion is broken more or less by hills as approach is made to the Blue Ridge and the Saluda and Chattooga mountains bordering the extreme northwest line, where the elevation runs to over 3000 feet in places. The north and west portions are the most thickly populated, especially in the Piedmont region. The northwestern portion is well watered by the Toxaway, Chattooga, Broad, Pacolet, Saluda and Tugalo rivers and their many tributaries. The soils are gray sandy loams, yellow and red clays on the uplands and the dark loams from decomposed mica and other minerals in the lowlands. The Piedmont region, taking in a number of counties, has a rolling surface broken by hills which rise from 200 to 1000 feet above sea level. The soils are alluvial and dark red clay loams in the bottoms, highly fertile and capable of large yields of grains, grass, truck and fruit. The flat-woods sections of the Piedmont region produce exuberantly of the grasses and general forage crops. A large portion of this region is in a high state of cultivation, the products being cotton, corn, oats, potatoes, cowpeas, sugar cane, grasses, truck and fruits of all kinds. It is watered by the Savannah, Santee, Congaree and other rivers.

The islands off the mainland and the nearby counties of Hampton, Colleton, Berkeley, Dorchester and others, constitute a plain reaching back from the coast with a gradual rise, and covered with soils that are variously alluvial, loamy and sandy, exceedingly fertile and adapted to a great variety of agricultural production. On the islands, the high-priced Sea Island cotton grows prolifically, and their crops include also corn, oats, tobacco, rice, sugar cane, the grasses and forage crops, truck, melons and small fruits.

From colonial days, agriculture has formed the chief industry of South Carolina, and corn, cotton, rice and tobacco have been leading crops. Considerable quantities of indigo were formerly produced, but latterly its cultivation has almost been abandoned. Of recent years trucking has been developed to a large extent in many parts of the State, especially in the rich alluvial and loamy soils about Charleston and Beaufort. Early vegetables are produced there in large quantities and shipped to Northern markets by the train load. Near Charleston is the largest cabbage farm in the world, one

man devoting to the production of that single vegetable each year 1000 acres of land. Tea is successfully grown near Summerville.

South Carolina's truck-growing industry is really a development of the past forty years. It is typed by results in Charleston county. There in the early seventies two men planted half an acre of land in cabbages and eight or ten acres in potatoes. From that pioneer effort the industry in the county has developed until today there are 14,000 acres in cultivation of the kind yielding annually more than \$2,500,000 of crops. Last year 5000 acres yielded \$800,000 worth of cabbages; 4000 acres, \$700,000 of potatoes; 2000 acres, \$600,000 of cucumbers; 2000 acres, \$312,000 of beans, and 1000 acres, \$150,000 worth of asparagus, lettuce, beets, turnips, radishes, etc. In the early days, commission men of Baltimore, Philadelphia and New York who advanced money to the truckers practically controlled the distribution of the crops, but in the past six or seven years a number of brokers' firms have been established at Charleston, with the results of a far wider distribution of the crop and of the readiness of local bankers to supply any funds for the growing that may be needed. Two trunk line railroads furnish facilities for shipments, which at the height of the season aggregate from 75 to 100 carloads a day, and which last year reached an aggregate of about 4000 carloads of cabbages, 1000 of potatoes, 800 of cucumbers, 600 of beans and 500 of miscellaneous vegetables. A striking feature of this industry in the neighborhood of Charleston is that truck crops are followed, without additional fertilization, by second crops and, sometimes, by third ones, cabbages by corn and potatoes by cotton, hay, turnips, etc., and one offshoot of cabbage raising is the raising of cabbage plants, which are sent for setting out to thirty-seven States, as far west as Iowa and Idaho and as far north as Michigan and Massachusetts. Last year 145,000,000 plants of the kind were sold from 346 acres. The second generation of truckers in this region have now entered the field, which has been created through the application of hard work and common sense to a naturally productive soil, and their work has been reinforced by a liberal use of fertilizers.

For a time following the Civil War agriculture languished throughout the State, but during the past few years it has been in a flourishing condition, and advances are now being made that promise to carry it far beyond any position it has heretofore attained. This is due to the education of the people in more approved methods of agriculture, to the rotation of crops as in ante-bellum days, the fertilization of the soil, the raising of their own supplies, the planting and care of orchards and gardens and placing the business of the husbandman upon a higher and better plane generally. South Carolina holds the world's record for the largest yield of corn per acre. Prior to 1860, this State had a well-rounded agricultural development, as did most of the States of the South, which was changed by the tenant system following the war. Of late years marked progress has been made in returning to the scientific farming of ante-bellum days and to better fertilization, resulting in a large and steady increase in crop yields per acre.

There has been much improvement also in the growing of stock, introducing better breeds of cattle, horses and hogs, and these matters are now commanding the close attention of a large portion of the farming population. Dairying is also being engaged in upon a much larger scale than ever before, and some very fine dairy herds are to be seen at various places. Many farmers who have been for years buying their meats are now raising hogs, and find that no branch of the farming industry pays better. Hogs can be as cheaply raised, matured and fattened in South Carolina as anywhere in the country, a fact that is being learned to the great profit of many growers.

South Carolina is rich in mineral deposits. Those that have been found to exist in the State are clays, fullers' earth, lime, glass sand, gold, manganese ores, mica, mineral waters, monazite, phosphate rock, quartz, sand and gravel, granite, silver, tin and numerous building stones, copper, asbestos, corundum, feldspar, graphite and lead and iron ores. All these have been produced in varying quantities.

There is a great abundance of granite in various parts of the State, and large quantities of it have been quarried for use in building and for high-grade monumental work. Other building stones also abound in numerous localities. Clays for making brick and tile abound in practically all sections, and there are extensive deposits of high-class kaolin, of which large amounts are shipped annually to other States for use in making pottery. Large deposits of phosphate rock lie in several counties and a considerable amount is mined



each year for use in the manufacture of fertilizers. For many years, South Carolina was the leading producer of phosphate rock, but it is now outranked by Florida and Tennessee. Charleston is said to be the largest manufacturer of fertilizers in the world.

In manufacturing South Carolina has made rapid strides in the past few years. The manufacture of cotton goods holds first place in importance, the State being one of the leaders in that industry. In a number of phases of the cotton manufacturing business it has been the unquestioned leader. It was at Columbia that electricity was first used to drive the machinery of a cotton mill. The development of the cotton industry in the Piedmont section has been very rapid. Under its stimulus old towns have become active, progressive places, and many new towns have been brought into existence by cotton mills. In no other State in the Union has there been a broader and more well-rounded growth in cotton manufacturing than in South Carolina. The State is especially noted for the size of its mills and for their remarkable financial success.

In the matter of railroads, South Carolina has three important trunk lines traversing its territory—the Southern, the Seaboard Air Line and the Atlantic Coast Line—giving its various localities direct connection with the leading points north and east, while from the coal fields of Southwestern Virginia, in direct line, comes the Carolina, Clinchfield & Ohio, one of the most remarkable railroads ever built. This road cross-sections the mountain ranges that divide its termini, but so remarkable was the engineering feat accomplished by its builders that the maximum grade encountered by eastbound freight is so low that the line is enabled to handle trains of much larger tonnage than is possible on roads built on less favorable grades. This road, from the mining town of Dante in the hills of Virginia to Spartanburg, S. C., tunnels mountains, strikes by great steel viaducts and immense dirt fills from hill-top to hill-top, bridges streams and winds through valleys, making one of the most picturesque and interesting railroad routes to be found anywhere. The road is now being driven through the mountains to connect with the Chesapeake & Ohio and the Baltimore & Ohio in Eastern Kentucky, thus securing connections that will reach directly to the Great Lakes and the rich wide fields of the Middle West. It is also building extensive terminals, docks and coal-handling appliances at Charleston in anticipation of the increase of trade that will come to that port upon the completion of the Panama Canal.

There are a number of harbors along the coast of South Carolina, the principal port being Charleston.

Much timber still stands in South Carolina, great forests of pine in the lower uplands, swamps filled with cypress in the lowlands, while on the hillsides and the mountains there are many millions of feet of hardwoods awaiting the axe of the woodman. A very considerable lumbering business is being done, employing many people and bringing a great deal of money to the State each year.

While rapidly developing in material things, South Carolina is not lagging in the matter of education. The State has a good public school system and a number of colleges and technical schools that rank high. Special attention

is given to training the young to meet the material conditions of life, and agriculture is being taught, both in the schools and by practical demonstration upon the farms. The State is spending \$2,000,000 annually upon its schools.

The political history of South Carolina is well known, and the names of its statesmen are fixed in the records of the country. But there is a side to the story that has been overlooked by many and forgotten by most. That is the eminently practical application of governmental policies made by the leaders of thought and action before the days of the Civil War. They caused the State to undertake a comprehensive system of waterway improvements, by which it was intended to canalize the rivers from the sea to the mountains, and a large part of the work had been done at great expense when the practical application of steam to transportation by means of the railroad was made, and these statesmen found that the slow canal would not do. They were among the first to give practical recognition to the superior qualities of the railroad and, deserting their canals, they began to build State railroads. It is a significant fact that the first steam railroad built in America was from Charleston westward, the intention being to extend it into the rich valley of the Mississippi, so that the products of that section might reach tidewater through the port of Charleston. The Clinchfield line is itself the fulfillment of an enterprise undertaken by South Carolina long before the war.

It is an interesting historical fact that the first locomotive built in America for an American railroad was built for a South Carolina line. It was named "The Best Friend," indicative of the far-seeing vision of the men of that day as to the value of railroads in the advancement of the world.

The mild climate of South Carolina has made it a favorite winter resort for many people from Northern States, and large modern hotels have been built at a number of places for the accommodation of tourists. This feature has proved its value in numerous instances by attracting searchers for winter comfort who became permanent citizens and investors.

South Carolina has a public school system comprehensive in scope and up-to-date in character. It is headed by a great State university located at Columbia, and embraces the various courses of instruction between that and the primary school. Agriculture and technological training are given those of the young who desire to follow vocations calling for such knowledge, and the work along those lines has borne fruit in better farming and in the ability of the young men of the State to take charge of various industrial enterprises calling for the exercise of special knowledge. The amount of money expended for public schools has increased from a third of a million dollars a year in 1880 to two millions at the present.

South Carolina has recently been devoting a great deal of attention to the building of good roads, and numerous improved highways have been built in various portions of the State. The influence of such highways there, as elsewhere, will be to greatly broaden agricultural development, furnishing as they do not only cheaper, easier and more convenient methods of marketing the products of the farm, but adding greatly also to the pleasures of farm life by making communication between neighbors more ready, thus removing the greatest objection to rural existence, extreme loneliness.

### SOUTH CAROLINA SUMMARIZED STATISTICALLY.

Land Area, 30,495 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	995,577	1,151,149	1,340,316	*1,550,000
Manufactures: ‡				
Capital .....	\$11,206,000	\$29,276,000	\$67,356,000	†\$173,221,000
Products—value .....	\$16,738,000	\$31,927,000	\$58,749,000	†\$113,236,000
Cotton Mills:				
Spindles active .....	82,334	332,784	1,431,349	4,314,157
Looms active .....	1,676	8,546	42,663	106,633
Cotton used, pounds .....	15,601,005	64,000,600	230,053,807	340,663,657
Cottonseed Oil Mills:				
Products, value .....		\$927,746	\$3,103,425	†\$10,170,000
Lumber cut, feet .....	185,772,000	197,940,000	466,109,000	†584,872,000
Improved farm lands, acres .....	4,132,050	5,255,237	5,775,741	\$6,085,000
Farm lands, buildings, value .....	\$68,677,482	\$99,104,600	\$126,761,530	\$§331,833,000
Agricultural products, value .....	\$41,108,000	\$51,338,000	\$68,267,000	*\$165,791,000
Cotton crop, running bales .....	522,548	747,190	881,192	*1,300,000
Grain, bushels:				
Corn .....	11,746,000	16,078,000	13,129,000	34,278,000
Wheat .....	870,000	750,000	2,143,000	727,000
Oats .....	3,688,000	4,168,000	4,023,000	6,966,000
Livestock:				
Cattle .....	339,000	242,143	343,000	400,000
Sheep .....	119,000	79,421	72,000	34,000
Swine .....	628,000	494,696	619,000	797,000
Mineral products, value .....	\$794,086	\$3,303,854	\$2,451,086	*\$1,900,000
Phosphate, tons .....	190,763	463,998	329,173	*171,000
Railroad mileage .....	1,427	2,289	2,919	3,598
National Banks:				
Resources .....	\$7,827,604	\$9,724,683	\$11,934,976	\$41,748,867
Capital .....	\$2,451,100	\$1,798,000	\$2,083,000	\$5,785,000
Individual deposits .....	\$2,586,177	\$3,511,123	\$5,171,644	\$19,673,137
Other banks, deposits .....	\$658,812	\$4,842,368	\$8,774,786	\$40,978,407
Common school expenditures .....	\$324,629	\$450,936	\$894,004	\$§1,952,000
Property, true value .....	\$322,000,000	\$400,911,000	\$485,700,000	*\$884,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910.

## TENNESSEE

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	<b>\$37,075,000</b>	<b>\$72,355,000</b>	<b>\$108,145,000</b>	<b>\$216,000,000</b>
<b>Farms.....</b>	<b>\$62,076,000</b>	<b>\$55,194,000</b>	<b>\$106,166,000</b>	<b>\$188,665,000</b>
<b>Forests.....</b>	<b>\$6,225,000</b>	<b>\$15,123,000</b>	<b>\$30,213,000</b>	<b>\$34,563,000</b>
<b>Mines.....</b>	<b>\$1,115,000</b>	<b>\$4,871,000</b>	<b>\$8,652,000</b>	<b>\$21,400,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



TENNESSEE has an area of 42,022 square miles, of which 335 are covered by water. Of the land, about 21,000,000 acres is classed as farm land and of this something like one-half is improved, leaving 10,000,000 acres in round numbers still to be brought to tillage and made productive. The State runs east and west 432 miles, and north and south 100 miles—from over against Virginia and North Carolina to the Mississippi River, and from the Kentucky border to Georgia, Alabama and Mississippi. It is a State of mountains and rivers, of rich rolling plateau lands and broad fertile valleys. There are three well defined divisions—East Tennessee, Middle Tennessee and West Tennessee. East Tennessee is the extreme eastern portion of the State, with mountain peaks that rise to more than 6000 feet above the sea, cut by numerous valleys of greater or less extent and overlooking generally the great valley of East Tennessee. The western portion of this division lies upon the Cumberland Plateau, an elevated plain lying 2000 feet above sea level. East Tennessee has numerous rivers, among them the Tennessee, the French Broad, the Holston, the Clinch, the Watauga, the Hiwassee, the Powell and the Nolachucky, which, with their affluents, amply drain and water it. The soils of this division are light and sandy in the uplands; rich and fertile in the valleys. In the lower reaches, they produce good crops of corn, wheat, hay, tobacco, peanuts, vegetables and fruits, especially apples.

Middle Tennessee is that portion lying immediately west of the Cumberland Plateau; some 500 feet below the highland rim, and with elevations of from 800 to 900 feet. It has an undulating surface, with wide reaches of level lands well watered and well drained by the Tennessee, Cumberland and other rivers and their tributaries. The soils of Middle Tennessee are sandy loam, cherts and limestone lands of great fertility. They are highly productive of cotton, grains, grasses, fruits and vegetables.

West Tennessee, comprising that portion of the State lying west of the Tennessee River and reaching to the Mississippi, is composed of rolling plateau and bottom lands, the former ranging from 1000 to 1500 feet in elevation, while the latter lies as low as 400 feet above sea level in the Tennessee valley and 250 feet in the Mississippi bottoms. West Tennessee has the Mississippi, the Tennessee, the Loosahatchie and other rivers. The soils run from light sandy loams to the rich alluvia found in the river bottoms, some of which are as fertile as are to be found in the entire country. Cotton, the grains, grasses and legumes, tobacco and fruits and vegetables of every kind grown in that latitude are produced in abundance wherever cultivated.

The climate of Tennessee is subject to the variations that go with its variations of elevation, running from zero in some places in winter to about 90° in summer, the average through the year for the State being about 60°. The rainfall is approximately 53 inches. The time intervening between spring and autumn frosts is from 162 to 228 days, giving ample time for most crops to mature.

Diversified farming has long been the rule in Tennessee and is now well diffused throughout the State, though because of local conditions there is specializing in localities. This is true of those sections in which cotton grows best, and in some others with respect to their peculiar adaptability to other products. Corn is the leading crop and is grown in all portions of the State. The yield in 1912 was 86,600,000 bushels. Cotton comes next in value, being chiefly produced on the Mississippi bottom lands, its value averaging about half that of corn. Then come wheat, hay, tobacco, oats and potatoes in the order named. Wheat produces well in the eastern and middle sections and is grown to a considerable extent also in some portions of West Tennessee. The various grasses and legumes that are cut for hay—timothy, clover, alfalfa, vetch, soy beans and cowpeas—grow in all sections of the State, and blue grass springs up spontaneously in some whenever cultivation is suspended. Tobacco growing is extensively carried on in a number of counties, and much of the product is exported to Italy and Belgium. Oats make a good crop wherever sown. Potatoes grow throughout the entire State, the uplands being especially adapted to the production of the winter varieties.

Going hand in hand with general agriculture and running close in value to the crop output is the livestock business of Tennessee. The State has long been noted for the production of horses, mules and cattle of the finer grades, those regions to which blue grass is indigenous being especially adapted to the growth of these. Dairying is growing rapidly in importance also, large

plants being devoted to it in the neighborhood of all the leading towns. The breed of dairy stock is being constantly improved, and it is expected that Tennessee will before long become a large shipper of dairy products.

Trucking has been found a profitable occupation, especially in those sections from which the transportation facilities carry quickly to the big markets of the country and in the vicinity of the larger towns, where there are good local markets. Good profit has been made in raising Irish potatoes, sweet potatoes, peas, beans, cauliflower, onions, tomatoes, asparagus, celery, water-melons, canteloupes and other crops grown for the table. This branch of agriculture has been carried on commercially for but a few years, and will doubtless be greatly expanded from its present proportions in the near future.

In the matter of soils, climate, elevation and drainage—conditions requisite to the successful production of fruit—Tennessee offers excellent advantages. Apples, peaches, pears and plums are grown in various localities, and with the application of scientific methods of culture and care of orchards has come the production of fruit of the highest degree of excellence. A great many strawberries and other small fruits are being grown also, and large shipments are made to the markets of the North in season. Fruit growers' associations have been formed, through which the products are put into the markets at the least possible cost, and the excellent facilities for transportation in which the State abounds lend encouragement to the expansion of commercial orcharding and small fruit growing.

Poultry raising is another branch of husbandry that is receiving a great deal of attention at this time. This has grown to be of very considerable importance in some sections, notably throughout that part of East Tennessee between Knoxville and Johnson City, from which thousands of chickens, turkeys, ducks and geese are sent to market annually. The value of the poultry in Tennessee in 1910 was \$3,748,329, as given by the census.

In the western portion of the State there is a swamp area of 1,000,000 acres which can by drainage be made as fertile as the lands in any part of the State. Under a drainage law passed in 1909, four drainage districts have undertaken the drainage of 100,000 acres. The estimated cost of the work is \$1,000,000; the estimated value of the land when drained is \$5,000,000. It is estimated that the drainage of the entire 1,000,000 acres can be accomplished for \$10,000,000, and that the land when drained would be worth \$50,000,000.

There are still vast areas of forest lands in Tennessee and many millions of feet of merchantable timber. These are found principally in the mountain counties and in the Mississippi bottoms, where many acres are found from which a stick of timber has never been cut, and which offer profitable investment to the lumberman as well as the investor. The valuable woods found in the State are the oaks, poplar, hickory, linden, ash, walnut, hemlock, maple, beech, cedar, cypress, juniper, gum, locust, sycamore and cottonwood, and others of value for special purposes. It is estimated that the State has still standing some 50,000,000,000 feet of timber.

In minerals Tennessee is peculiarly rich. Its coal area is 4400 square miles—nearly one-half as much area as Great Britain and two and a half times as much area as Germany. Tennessee coals include coking, steam and domestic grades, many of them of the very highest class. The output of coal in 1912 was 6,400,000 tons, about double the production of 1900, and operations now under way will probably result in a steady and very large increase within the next few years.

According to reports of the United States Geological Survey, there are in Tennessee iron ore deposits having an aggregate of about 500,000,000 tons, but the probability is that the total supply is considerably larger. In "Thirty Years of Southern Upbuilding" issued last year by the Manufacturers Record, Prof. John J. Porter, a well-known metallurgist and engineer, who has made a careful study of that section, said of the Chattanooga district: "In my estimation it offers one of the best, if not the best, opportunities for a steel plant to be found in this country." Tennessee ranks second in the Southern States as to pig-iron output, its production for 1912 being 338,238 tons. New enterprises recently projected give promise of bringing about a very much larger development of iron making in this State. In the iron industry, Tennessee is especially notable for the extent of its diversified interests, turning pig-iron into pipe, plows, engines, boilers and other finished products.

Three species of phosphate—the brown, the black or blue and the white—are found in the State, the available supply being estimated at 100,000,000



tons, the annual output at present being about 400,000 tons; giving Tennessee the second position next to Florida in the production of phosphate rock.

Clays abound in all sections of the State, with valuable china clays in some portions and some kaolin in each division. The tile and brick industry is of considerable extent. A fair amount of ball clay and of fire clay are shipped annually to other States. Limestone and marbles of great variety and of high quality are scattered over the State, and onyx is found in small quantities. The State ranks third in the production of marble, which is shipped to many parts of the country and used largely in interior finish in office and other buildings. The limestones are quarried in many places, and there are numerous lime plants. Shales are abundant. Within the last few years the Portland cement industry has been developed by the building of two plants of large capacity and the most modern equipment, which are doing a very heavy business.

Building stones of excellent quality abound. Slate is quarried in the eastern section. Zinc is found in large quantities. Bauxite is mined in considerable quantities in the eastern section, while gold, silver, lead, barytes, metallic paints, mortar colors, pyrites, fluorspar, potash sand, alum, copperas, epsom salts, graphite, feldspar, asbestos and other minerals exist in greater or less abundance in various places. Plans are in progress for the building in East Tennessee of an aluminum plant at an outlay, including the necessary water-power development, reported at \$12,000,000 or more.

In manufacturing, Tennessee has made rapid progress in the past few years the value of the output of manufactured products in 1912 having been about \$216,000,000, or exactly double the total of \$108,000,000 in 1900. With raw materials abundant for a very wide range of manufacturing, with ample coal of high quality for fuel, with exceptional hydro-electric potentialities, one of the striking facts connected with the industrial activities of the State is their wide diversity. No one interest is of dominating importance. There has been a steady, healthy growth in iron-consuming enterprises, foundries and machine shops, in woodworking interests, in milling and other pursuits; but the resources of the State justify a development in manufactures and mining, as well as in agriculture, many times greater than what has been accomplished.

Tennessee is fairly well supplied with transportation facilities. The Mississippi River, flowing along the entire western border and its many other rivers, give the State many miles of navigable streams which, when fully utilized, will be of enormous value to every interest in the State. These are supplemented by five trunk line railroads which, with numerous smaller

roads, have over 4000 miles of trackage penetrating nearly all sections of the State and reaching, with their connections, all the markets of the country.

Tennessee has many water-power sites, and some developments of importance have been made recently. These will be greatly increased by developments now in progress, which are being carried out at a cost of many millions of dollars, backed by some of the leading financial houses of the East and the West. These improvements are in several cases of exceptional magnitude, and their influence upon the advancement of the State will be very far-reaching.

Of late Tennessee has been paying much attention to the building of good roads, and many miles of macadamized highways have been laid. Jefferson county, which has recently issued \$395,000 of bonds for roads; Cocke county with \$200,000, McMinn with \$225,000, Monroe with \$300,000, Bradley with \$200,000, Putnam with \$250,000, White with \$200,000, are some of the leaders of the good roads movement. A highway from Bristol to Memphis is being built by the State, and the various counties within reach are building roads to connect with it. These are but indications of the good roads activity throughout the State.

Tennessee's public school system consists of the State University, four normal schools, three for white and one for colored; city and town schools running in most instances from the primary through the high school grades; county high schools and county elementary schools. The State University has medical, law, dental, mechanical and agricultural departments. A State farm and experimental stations are maintained, that the instruction in agriculture may be both practical and theoretic. The impetus given agriculture by teaching approved methods to the young men of the State has already borne fruit in increased yields of various crops, the restoration of soil on hundreds of farms and a general forward movement in agriculture and stock raising. The State spends about \$1,000,000 a year upon its public schools. In addition to the public schools, Tennessee has many private educational institutions, including universities, professional colleges, seminaries, academies and business colleges.

Tennessee in richness of resources, in minerals, timbers, water-powers, soils and range of climate based on altitudes; in river transportation possibilities, and with its central location between the cotton-growing States and the Central West, has a combination of advantages that should make it one of the most prosperous and progressive sections of the Union. Probably no other State in the Union has a greater combination of advantages for industrial and agricultural development covering the widest diversity in both.

#### TENNESSEE SUMMARIZED STATISTICALLY.

Land Area, 41,687 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,542,359	1,767,518	2,020,616	*2,216,000
Manufactures: ‡				
Capital .....	\$20,093,000	\$51,475,000	\$71,814,000	‡\$167,924,000
Products—value .....	\$37,075,000	\$72,355,000	\$108,145,000	‡\$180,217,000
Cotton Mills:				
Spindles active.....	35,736	97,524	123,896	254,684
Looms active.....	818	2,043	2,995	4,325
Cotton used, pounds.....	4,944,279	15,779,360	15,040,336	37,070,437
Cottonseed Oil Mills:				
Products, value.....	\$1,235,000	\$2,504,741	\$2,980,041	‡\$5,083,000
Pig-iron made, tons.....	63,279	267,626	362,190	338,238
Coke made, tons.....	130,609	348,728	475,432	*300,000
Lumber cut, feet.....	302,673,000	450,097,000	939,463,000	‡914,579,000
Improved farm lands, acres.....	8,496,556	9,362,555	10,245,950	\$10,875,000
Farm lands, buildings, value.....	\$206,749,837	\$242,700,540	\$265,150,750	‡\$479,606,000
Agricultural products, value.....	\$62,076,000	\$55,194,000	\$106,166,000	*\$188,665,000
Cotton crop, running bales.....	330,621	190,579	215,668	*280,000
Grain, bushels:				
Corn .....	62,470,000	67,692,000	56,998,000	86,632,000
Wheat .....	7,539,000	7,873,000	11,696,000	7,004,000
Oats .....	5,849,000	6,486,000	5,810,000	5,599,000
Livestock:				
Cattle .....	756,000	924,709	912,000	961,000
Sheep .....	673,000	540,996	496,000	762,000
Swine .....	2,160,000	1,922,912	1,977,000	1,574,000
Mineral products, value.....	\$1,115,155	\$4,871,083	\$8,651,904	*\$21,400,000
Coal mined, tons.....	495,131	2,169,585	3,509,562	*6,400,000
Iron ore mined, tons.....	63,279	465,695	594,171	*495,000
Petroleum, barrels.....		(Included in Kentucky)		
Phosphate, tons.....			454,491	*440,000
Railroad mileage.....	1,843	2,767	3,185	4,143
National Banks:				
Resources .....	\$13,390,627	\$34,847,582	\$41,213,509	\$107,403,026
Capital .....	\$3,005,300	\$9,773,240	\$7,337,645	\$12,580,000
Individual deposits.....	\$6,588,048	\$15,121,303	\$22,082,775	\$60,864,395
Other banks, deposits.....	\$3,222,740	\$9,088,121	\$10,957,562	\$62,280,544
Common school expenditures.....	\$744,180	\$1,526,241	\$1,751,047	‡\$4,403,000
Property, true value.....	\$705,000,000	\$887,956,000	\$956,700,000	*\$1,311,000,000

\*Partly estimated. †Not including neighborhood industries and hand trades in 1909. ‡Figures of 1909. §Figures of 1911. ¶Figures of 1910.

# TEXAS

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	<b>\$20,720,000</b>	<b>\$70,434,000</b>	<b>\$119,415,000</b>	<b>\$327,000,000</b>
<b>Farms.....</b>	<b>\$65,204,000</b>	<b>\$111,699,000</b>	<b>\$239,823,000</b>	<b>\$607,830,000</b>
<b>Forests.....</b>	<b>\$6,121,000</b>	<b>\$19,905,000</b>	<b>\$27,160,000</b>	<b>\$55,678,000</b>
<b>Mines.....</b>	<b>\$135,000</b>	<b>\$2,360,000</b>	<b>\$5,296,000</b>	<b>\$18,500,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



TEXAS has a land area of 262,398 square miles. It is as large as the combined area of the New England States, New York, Pennsylvania, New Jersey, Delaware, Ohio and Illinois. It is larger by 55,000 square miles than France, and by 54,000 square miles than Germany.

The State's surface rises from a few feet above tidewater on the coast to 9560 feet on Guadalupe Peak, in Culberson county, passing through low coastal plains and rolling prairies to high plateau lands and rapidly rising mountains. In the eastern section are great forests of pine and hardwood, while west of the central portion the prairies are bare of timber, except that of a scrubby nature unfit for the saw. Its soil varies through sand to sandy loams, to the rich "black waxy" of the prairies formed by the decay of the vegetable matter which has grown and rotted upon them for ages. These lands are for the most part very fertile, even the sands being capable of producing certain fruits and vegetables.

The climate varies from that of Southern Florida to that of Southern Kansas, with the modifications caused by the vast differences in altitude. In some portions of Texas can be grown any kind of vegetable, fruit or grain grown anywhere in the United States, from wheat and winter potatoes to bananas and oranges.

Texas comes close to leading the States in the value of agricultural products. The principal crop of the State is cotton, Texas producing on an average crop not far from one-third of the total cotton yield of the country. In 1912 the cotton crop of the State was about 4,700,000 bales or over. But cotton does not monopolize by any means the agricultural activities of the State. The grain production, comprising corn, wheat and oats, will run from about 125,000,000 to 200,000,000 bushels a year, according to the season. The State has nearly 170,000,000 acres of land, of which less than 30,000,000 acres is counted as improved farm lands, but even on the present acreage Texas produces a larger value of farm crops than any other State.

Next to cotton in importance comes the stock-raising interests of the State. Much of the area of West and Northwest Texas is still given over to vast pastures in which thousands of cattle graze, the State having over 10,000,000 head of livestock. Horses and mules are also raised in large numbers, and the aggregate value of the State's product in cattle, horses and mules is reported as one-twelfth that of the entire country. Sheep and hogs are also raised to a considerable extent. Large packing-houses and stock yards at Fort Worth have made that city one of the leading livestock markets in the United States. There are slaughtered there annually about 1,750,000 head of livestock. Packing-houses are also operated in other cities of the State.

Corn and oats are grown in practically all parts of the State, and considerable wheat is produced in the north and northwestern portions. Rice growing has become an important industry in the southeastern section in the last 20 years, the product being now more than 8,000,000 bushels annually. Sugar cane has long been grown in the bottom lands of the Brazos and other valleys in South Texas, and some millions of pounds of sugar are manufactured each year. An area of 400,000 acres of land in the valley of the Rio Grande is said to be equal to the best sugar land in the world.

Gardening and truck growing are carried on extensively in different parts of the State, and thousands of carloads of the products are shipped to the Northern and Western markets each year. Remarkable progress has been made in the production of Bermuda onions, which has become one of the leading and most profitable agricultural interests of the State. Tomatoes, potatoes, celery, beans, peas—all the popular garden crops—are grown in great abundance. Peanuts have also been found a paying crop and thousands of bushels are being raised.

In the more southerly sections, especially in the Rio Grande region, oranges and sub-tropical fruits are being grown with success, and strawberries are sent into the markets early enough to compete with the Florida crop. Watermelons and canteloupes equal to the best produced anywhere are grown all over Texas. Peaches produce well over a large area, and during the last few years, especially in East Texas, peach growing has become an important branch of industry, and thousands of carloads of peaches are annually shipped to outside markets. Pears, plums, cherries and grapes are produced in large quantities in various sections, and many figs are grown in the southern portion.

Texas has a considerable area of land that is well adapted to the culture

of tobacco of the finer grades. In the late nineties there was a good development in tobacco growing and the product proved of great value, being used as wrappers for the finer grades of cigars.

Poultry raising in the last few years has come to be esteemed as one of the most important branches of farm industry, and many yards have been established for the purpose of carrying on the business on a scientific and commercial basis. The climate in much of the State is such that fowls can live in the open during the entire season, and the laying season is so long that it runs through practically all of the 12 months. Chickens, turkeys, ducks, geese and guineas are profitably raised and the business is rapidly increasing.

Bee culture is another calling that is being largely engaged in in various places, and the output of the State in honey is said to be larger than that of any other State. The value of the bees in Texas is estimated to be \$5,000,000, and the value of the annual output is put at the same figure.

Pecans are indigenous to Texas, which has been called the pecan orchard of the world. The English walnut is being grafted on the native walnut tree in Texas with success, and the production of that rich and popular nut in large quantities is among the probabilities of the future. Prunes, apricots and Japanese persimmons produce well and all will be raised in commercial quantities in the next few years. Date palms have been grown in the lower coast country and on the islands bordering the coast for many years, and their cultivation as a matter of business is regarded as one of the certainties of the future.

Another industry that seems certain of development is the manufacture of camphor. Camphor trees grow to large size in Texas, but there has thus far been only one attempt to produce camphor as a business.

The lumbering operations of the State are on a very large scale, the total cut being about 1,900,000,000 feet a year. This lumber is shipped largely to the West, while a very considerable portion is exported through gulf ports to foreign countries.

About 10 years ago Texas, by reason of the striking of some wells of unusual productivity, began to attract attention for its great stores of oil. It has now become one of the leading oil-producing States of the Union. It has extensive pipe lines connecting the various oil fields of the State, as well as the oil fields of other States, with gulf ports, where large refineries exist, and from which points heavy shipments are made to the Atlantic ports of the United States and to foreign countries. Natural gas is also found in a number of different localities, and is being used for light and fuel in several cities of the State.

The coal area of the State is 10,200 square miles, and in addition to this there are 55,000 square miles of lignite, the aggregate coal resources alone being estimated at over 30,000,000,000 tons. The coal output of the State is now about 2,000,000 tons a year. Lignite is being mined to a considerable extent and, used in producer gas plants, has proved a very efficient power producer.

The clay industry is an important one in Texas. The clays produced include fire clays, pottery clays and the clays used in making common brick. There are also deposits of clays of the class used in making porcelain. Pottery is made at several points in the State. Paving bricks, pressed brick and ordinary building brick are made at many places.

Iron ore is found in three distinct sections of the State—Llano, the Trans-Pecos and the East Texas region. In the last-named section there have been proven out large deposits of brown ores of good quality which can be easily mined with steam shovels and easily reduced in the furnace. During the last few years active investigations have been in progress, considerable railroad building has been undertaken in order to reach some of the larger deposits, mining operations on a considerable scale have been undertaken, an extensive iron ore shipping pier has been constructed at Port Bolivar and contracts have been made for the shipment of this ore to Atlantic coast ports. It is estimated that the available supply of ore in Texas will run into some hundreds of millions of tons, a very considerable proportion of which can be mined with steam shovels. The plans of those who have been developing these large properties during the last year or two include not only the shipment of ores through Port Bolivar to Atlantic Coast ports for use in furnaces in Pennsylvania and other States, but also the probable building of



a furnace and steel plant at Port Bolivar, where the Texas ores can meet coking coal from the Virginias or Alabama and be smelted to advantage. These properties have been investigated by some of the foremost experts of the country whose reports as to the quantity and quality of ores and their availability for large operations have justified railroad building to reach that territory, and the construction of a large pier for handling the ore. The active operation of some of these properties has been temporarily retarded by the failure to complete certain railroad negotiations.

Other minerals possessed by the State in varied quantities are silver, which is found in workable veins in the far Western portion, copper, lead and zinc; salt, of which there are valuable beds, some of which are being operated; quicksilver, now being worked in Brewster county; fuller's earth, glass sand, ochers, limestone, building stones of many kinds, cement rock, gypsum, etc. Probably no other State in the Union is more liberally supplied with granite of many varieties and of the most beautiful texture. The granites of Texas for extent and quality have attracted attention for many years from experts throughout the entire country. Sulphur has been found at several places and a very large sulphur development is now under way near Freeport by some of the leading capitalists of the country.

Great progress has been made in manufacturing in the last few years, and now the annual value of the manufactures of Texas reaches a total of about \$327,000,000 a year. Lumber, with its annual cut of about 2,000,000,000 feet, is the leading industry of the State, but other industrial interests of very large extent are cottonseed-oil mills, flour, paper, fertilizer, farm and mill machinery, cotton gin and compress machinery, confectionery, electrical machinery, brooms, furniture, cotton goods, brick, pottery, tiling, iron and steel products, cement, cotton bagging and cotton ties. Though Texas has not been generally classed as much of a manufacturing State because of the overshadowing extent of its agricultural interests, the percentage of growth of manufacturing in that State has been exceeded by very few States in the Union. The capital invested in factories rose from \$64,000,000 in 1900 to \$217,000,000 in 1909. So great are the industrial potentialities of Texas covering almost every line of manufacturing that it is quite certain the future will witness a very great expansion in industrial activities.

On the Gulf coast of the State, the extent of which is 369 miles, there are a number of ports of rapidly growing importance. Galveston is now the second exporting city in the United States, the total value of its foreign exports in 1912 having been \$218,000,000, or largely in excess of the total exports of all the United States ports on the Pacific Coast, and more than Boston and Philadelphia combined. Texas City, on Galveston Bay, and Port Bolivar nearby are becoming important exporting points, about \$7,000,000 having been expended upon warehouses and terminal facilities at the former place. Texas City claims the most comprehensive warehouse system in America. At the mouth of the Brazos River there is being developed by

some of the strongest capitalists in the United States a new port known as Freeport by reason of the fact that it is to be free of wharfage charges. Close by this port is the sulphur deposit already mentioned which, it is thought, will equal in importance the remarkable sulphur mines in Louisiana, which produce nearly one-half of the world's sulphur output. At Aransas Pass another port enterprise of very considerable importance is being developed, backed by Eastern capital in connection with Texas money.

Port Arthur, created a few years ago by the builders of a railroad from Kansas City to that point, has become an export point of very considerable magnitude. At Houston \$2,500,000 are being expended in the deepening of the bayou, and the completion of this work will make Houston an inland port with ample depth of water to accommodate heavy shipping. Very great development of shipping interests is expected to follow this work.

Thus Texas, with its vast area and with much of the Southwest so located that its trade must necessarily find an outlet through Texas ports, is providing the port facilities for meeting this condition, looking not only to the needs of the near future, but to the traffic which it is expected will follow the opening of the Panama Canal.

Texas has large areas of land that must be drained to be made available for agriculture, and far greater areas which must be irrigated to be made productive. Drainage districts have been formed by law and large areas are now being drained in a number of counties. In great valleys and in other sections scattered widely over the State, irrigation plans are being worked out by which thousands of acres of dry lands will be made available for cultivation. These irrigated lands are especially valuable when provided with water. English capitalists are now developing two irrigation projects, one at an expenditure of \$6,000,000 and the other at a cost of about \$3,500,000, while other irrigation projects of large extent are being carried out by others.

It is estimated that the State has in its remaining public lands and in the investments which have come from the sale of lands, a potential school fund of over \$100,000,000. The school system is one of great efficiency embracing all grades from the elementary to the university. The amount spent annually on the public schools reaches a total of \$12,000,000. In addition to the State institutions there are many denominational and private institutions of learning of high standing and of large income. The Rice Institute now being established at Houston has an endowment of about \$10,000,000. It is designed that this shall be one of the great technical schools of the country.

Throughout Texas great attention is being given to roadbuilding, and some millions of dollars have been spent within the last few years in their construction. The State leads the Union in its railroad mileage, having 15,700 miles; but it yet needs many thousands of miles of road.

Imperial in extent as is this State, it is imperial in the richness of its resources, in the extent and variety of its mineral and agricultural resources, in its water-powers, in its long seacoast, in climatic advantages, and in nearly all of the things which furnish a foundation for human activity.

### TEXAS SUMMARIZED STATISTICALLY.

Land Area, 262,398 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,591,749	2,235,527	3,048,710	*4,064,000
Manufactures: ‡				
Capital .....	\$9,246,000	\$46,815,000	\$90,434,000	†\$216,876,000
Products—value .....	\$20,720,000	\$70,434,000	\$119,415,000	†\$272,896,000
Cotton Mills:				
Spindles active.....	2,648	15,000	48,756	97,074
Looms active.....	71	560	1,018	2,541
Cotton used, pounds.....	119,986	2,430,000	9,304,434	22,887,859
Cottonseed Oil Mills:				
Products, value.....	\$276,450	\$3,262,596	\$14,005,324	†\$25,034,000
Pig-iron made, tons.....	2,232	9,701	10,150	.....
Lumber cut, feet.....	328,968,000	839,724,000	1,230,904,000	†1,681,080,000
Improved farm lands, acres.....	12,650,314	20,746,215	19,576,076	\$27,120,000
Farm lands, buildings, value.....	\$170,468,886	\$399,971,289	\$691,773,613	\$81,822,713,000
Agricultural products, value.....	\$65,204,000	\$111,699,000	\$239,823,000	*\$607,830,000
Cotton crop, running bales.....	805,284	1,471,242	2,556,413	*4,670,000
Grain, bushels:				
Corn .....	66,755,000	63,802,000	81,963,000	153,300,000
Wheat .....	3,008,000	3,575,000	23,396,000	10,560,000
Oats .....	6,936,000	11,059,000	28,278,000	32,972,000
Livestock:				
Cattle .....	3,994,000	6,103,268	9,428,000	6,211,000
Sheep .....	3,651,000	3,454,858	1,889,000	2,032,000
Swine .....	1,950,000	2,252,476	2,666,000	2,544,000
Mineral products, value.....	\$134,640	\$2,359,634	\$5,295,753	*\$18,500,000
Coal mined, tons.....	.....	184,440	968,373	*1,900,000
Iron ore mined, tons.....	2,232	22,000	16,881	50,000
Petroleum, barrels.....	.....	54	836,039	10,500,000
Railroad mileage.....	3,244	8,710	9,992	15,843
National Banks:				
Resources .....	\$5,021,016	\$71,948,401	\$97,763,442	\$419,171,858
Capital .....	\$1,420,000	\$22,227,260	\$19,618,920	\$48,548,300
Individual deposits.....	\$2,080,993	\$30,449,724	\$49,749,109	\$223,425,335
Other banks, deposits.....	\$6,332,751	\$5,839,967	\$2,934,634	\$64,791,039
Common school expenditures.....	\$1,030,000	\$3,178,300	\$4,465,255	\$811,777,000
Property, true value.....	\$825,000,000	\$2,105,577,000	\$2,322,200,000	*\$4,180,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910.

## VIRGINIA

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	<b>\$51,781,000</b>	<b>\$88,364,000</b>	<b>\$132,173,000</b>	<b>\$264,000,000</b>
<b>Farms.....</b>	<b>\$45,726,000</b>	<b>\$42,244,000</b>	<b>\$86,549,000</b>	<b>\$157,340,000</b>
<b>Forests.....</b>	<b>\$5,723,000</b>	<b>\$9,385,000</b>	<b>\$20,228,000</b>	<b>\$44,300,000</b>
<b>Mines.....</b>	<b>\$1,263,000</b>	<b>\$3,274,000</b>	<b>\$5,659,000</b>	<b>\$17,000,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



VIRGINIA, in geographical location, physical conformation, climatic conditions, natural resources, industrial possibilities and historic and traditional associations, offers many things to convince the judgment and allure the fancy. Lying on the country's eastern coast, midway between Maine and Florida, extending in latitude from 36° 31' to 39° 27' north, its position corresponds to that of California and Southern Europe. Longitudinally it reaches from the Atlantic Ocean to the top of the Appalachian mountain range—from sea level to an altitude of nearly 6000 feet—with the wide ranges in soil and climate that such variations in latitude and altitude naturally give. The area of the State is 40,262 square miles of land and 2365 square miles of water.

The natural divisions of the State are five—Tidewater Virginia, Middle Virginia, the Piedmont section, the great Valley and the Mountain section. Tidewater Virginia includes about one-fourth of the territory of the State, and consists of the sections whose streams feel the ebb and flow of the ocean tides. It rises to an altitude of about 150 feet at the western edge. The soil is alluvial, being for the most part a light sandy loam underlaid with clay. The alluvial deposits contain a large proportion of decomposed shells and frequently cover extensive beds of marl. These soils are of great value in the production of early vegetables and berries, the influence of the gulf stream, whose current flows close by the shore, making the growing season still earlier than even latitude and altitude would otherwise cause.

Middle Virginia is a wide undulating plain, through which numerous rivers have cut their channels, being bordered by rich bottoms. The alluvial soils have a sub-soil of clays mixed with disintegrated sandstone rocks that supply additional elements of fertility. The ground rises gradually from the western edge of the Tidewater section to meet the sloping heights of the Piedmont region on the west, attaining a maximum elevation of 500 feet. This division has four large rivers that take their rise in the mountains of the Mountain division, and all—the Potomac below Washington, the Rappahannock below Fredericksburg, the James below Richmond and the York throughout its full length—rise and fall with the tides, and are navigable for many miles from Chesapeake Bay, into which they flow. The principal products of Middle Virginia are wheat, corn, oats and tobacco. Piedmont Virginia is an elevated belt of 250 miles length and an average width of 25 miles, lying west of Middle Virginia at an elevation of from 300 to 1500 feet. Its eastern line is bordered by wide plains of great fertility, covered naturally by nutritious grasses, which spring up spontaneously wherever cultivation has been suspended. The soil is heavier than that of the divisions to the east, the sub-soil being a stiff, dark red clay, and is enriched by the disintegration of the sandstone rocks that abound. This section is noted for its grazing qualities and is also highly adaptable to the culture of apples and grapes. Joining the Piedmont division on the west lies the great Valley of Virginia, far-famed in the martial, social and agricultural history of the country. It is made up, in fact, of five valleys, those of the Shenandoah River, the James, the Roanoke, the New River and the Holston—and extends entirely across the State from northeast to southwest—from where the Shenandoah breaks through the Blue Ridge at Harpers Ferry to join the Potomac, to where the Holston leaves the borders of the State to water the valleys of Tennessee. The elevation reaches from 260 feet at the mouth of the Shenandoah to 1687 feet at the southwestern extremity of the State. The soils of this division are of exceeding fertility, being enriched by the disintegration of the limestone with which they are underlaid, and produce abundant crops of the cereals, of grasses, fruits and vegetables of practically all kinds. It is well watered, and has been noted for a century for its high-bred stock and an equally long time for its elegant homes and the abounding hospitality of its people. Joining the rapidly rising western confines of the great Valley is the Mountain division. Its altitude extends from 1000 feet on the eastern border to 5750 feet, where it climbs to the mountain tops and spreads out toward the high, rolling surface of the Cumberland Plateau. Sandstone, shales and limestone are found in the valleys and on the hillsides, and the surface presented is of great variety. The valleys and some of the slopes, underlaid with limestone, are very rich. Watered by many streams and with an unfailing rainfall, this has long been noted as a grazing section, and as fine stock as can be found anywhere may be seen cropping the rich grasses of its valleys and

mountain sides. Much timber of excellent quality stands in the forests that cover the hillsides and mountain tops.

Agriculture easily holds first place among the industries of Virginia, being carried on in all sections and every county. It covers all branches—field crops, trucking and gardening, stock raising, dairying, poultrying and the growing of fruits. In Tidewater Virginia the trucking business has grown to enormous proportions, and Norfolk is said to be the center of the most highly developed gardening section in the entire country. The total value of the truck shipped from Tidewater Virginia during the year, 1912, is estimated at \$7,000,000 to \$8,000,000. It embraced lettuce, cabbage, kale, spinach, potatoes, beans, peas, asparagus, onions, radishes, strawberries, cucumbers, tomatoes, early corn; in fact, all the vegetables known to household economy and which, by reason of soil and climatic conditions, enjoy almost exclusive markets between the seasons farther South and those about the big markets North. Excellent railroad connections and unsurpassed facilities for transportation by water enable the growers to put their products into the best markets while crisp and fresh. Peanuts are an important crop in Tidewater Virginia, and the markets of Petersburg, Suffolk and Norfolk handle millions of dollars' worth of the product annually. Cotton is grown to a considerable extent in the southern portions of the State. The corn yield in 1912 was 47,520,000 bushels.

In Middle Virginia, the Piedmont region, throughout the great Valley and upon the heights of the Mountain division general husbandry commands the attention of a large proportion of the population, and corn, wheat, oats, the hay crops and other field crops are produced in large quantities. Cattle, horses, sheep and hogs are raised in all the counties, some of them being especially adapted to the best of the grasses. Dairying is carried on to a considerable extent in some sections, and poultry raising also commands considerable attention. In the valley and on the Piedmont Plateau are many fine orchards, the famous Albemarle pippin, primate of the apple family, reaching its highest state of perfection there. Two valley counties, with two adjoining West Virginia neighbors, are said to produce more apples than the entire States of Oregon and Washington. The yield of grapes in some of these counties is large also.

Virginia still has standing immense forests with hundreds of millions of feet of merchantable timber. Pine and cypress cover large areas of the coastal plain, the soil of which favors the growth also of cedar, willow, locust, juniper and gum, and to some extent oak, furnishing material for shingles, staves, ship timber and sawed lumber. In the central and western sections are found the oaks, poplar, walnut, hickory, chestnut, birch, beech, maple, cherry, ash, sycamore and elm; in the higher altitudes white pine, spruce and hemlock. Lumbering operations and general woodworking plants are located in all parts of the State, giving employment to thousands of people, and forming an important part of the State's industrial life.

In mineral resources, Virginia covers a wide range, for within the borders of the State are found in commercial quantities iron, coal, lead, zinc, copper, tin, manganese, pyrites, barytes, gypsum, marble, granite, limestone, slate, shale, asbestos, soapstone, building stones, mica, salt, brick and pottery clays, and even gold and silver have been produced at some profit. The largest pyrites producing plant in the whole country is in Louisa county. The coal area is 1910 square miles, the best deposits being in the Pocahontas field, in Tazewell county; the Clinchfield and Big Stone Gap regions, in Russell, Lee and Wise. The Richmond coal basin was the first to be exploited in the country. The hard coal fields of Montgomery county have been exploited to some extent. The chief production is in Tazewell, Russell, Lee and Wise counties.

Deposits of iron ore are found in a number of localities, especially in the James River valley and throughout other sections of the Great Valley and the mountain regions. Virginia ranks among the Southern States next to Alabama in iron production, with a yield of nearly 500,000 tons a year. It has very large diversified manufacturing interests, such as locomotive works, pipe works, shipyards, engine and boiler shops, and others using pig-iron as their raw material.

Granites of excellent quality are quarried in several counties, and large quantities have been shipped out for use in government and other buildings in other States, while slate from the Buckingham quarries has been shipped



to England and other countries abroad, where it successfully competed with the product of the Scotch and Welsh quarries.

Clays for making brick and tile are found in many places, and almost every section has its brick plant of greater or less capacity, while tile is made in a few places. Kaolin fitted for high-class pottery is mined in various places, but is practically all sent to outside points for manufacture, the pottery product in the State being negligible. Limestone and shales for the production of Portland cement abound in vast quantities, and the cement manufacturing business is carried on at several points.

Developments in zinc mining have been made in Wythe county, and considerable deposits have been uncovered elsewhere, and at Ferris, in Floyd county, arsenic is being mined.

The abounding numbers and great varieties of fish in the bays, rivers and estuaries of the coast section furnish employment to thousands of people, and Virginia fish and oysters find their way into many markets. An important branch of the fishing business is that of the menhaden fisheries at several points along the Chesapeake Bay, where thousands of tons of fish are caught annually to be used in the manufacture of oil and fertilizers.

Hampton Roads, where the James River meets the waters of the Chesapeake just before that great bay joins forces with the Atlantic Ocean, is one of the world's greatest harbors, where hundreds of vessels can safely anchor at one time. There at Newport News an immense shipbuilding industry has been built up, this yard probably being the largest and possibly representing more capital invested than any other shipbuilding concern in the United States. It gives employment to over 5000 people. There are built battleships for the Government and vessels of various kinds for the merchant marine. The navy yard at Portsmouth is one of the largest, and it is believed that if Navy plans are carried out, it will be expanded to make it the largest naval station in the United States. The Government has recently purchased 300 acres of land for enlarging its shipbuilding and docking facilities there.

The Hampton Roads basin, including Newport News, Norfolk and Portsmouth, is the largest coal-handling point in the United States. The Chesapeake & Ohio, the Norfolk & Western and the Virginian railways have their coal docks there, through which they ship annually millions of tons from the mines of Southwestern Virginia and West Virginia. The coal-shipping facilities are now being increased at a cost of several million dollars to provide for the rapidly expanding shipments of coal to coastwise and foreign ports.

Virginia has many manufacturing plants of a miscellaneous nature. Indicative of their extent and character a few illustrations may be mentioned. A Virginia locomotive works has just built for a Virginia railway what are said to be the largest locomotives in the world.

In Virginia is located what is said to be the largest trunk and bag factory in the world. Its product goes into every civilized country on the globe.

A Virginia cedar works concern, engaged in making buckets, tubs, ice-cream freezers and similar articles of every-day use, ranks as the largest in the world, and its product goes into all the world's markets.

Virginia is one of the leading tobacco raising and manufacturing States of the Union.

One of the most important cotton mill companies in the South is located in Virginia, being capitalized at \$15,000,000. It is now spending \$2,000,000 on an additional plant.

Great pulp mills located in Virginia make many thousands of tons of pulp annually. Sixty per cent. of the country's product of blotting paper is made in the State.

Shoe manufacturing has become one of the important industries of the State and Virginia-made shoes are now sold largely throughout the South and Southwest.

A flour milling industry is one of the State's important possessions, and many thousands of barrels are exported, especially to South and Central American countries.

Many streams present opportunities for the development of water-power, and while a number of very important hydro-electric plants are in operation in many parts of the State, the aggregate of available power is much greater than the amount thus far utilized. In Southwest Virginia one company is developing a number of powers at an outlay of about \$20,000,000, while other large powers will be developed.

There are numerous mineral springs in the State, about some of which have been built up summer resorts that draw people from every section of the country. From early days Virginia has been noted for the variety and abundance of its mineral waters whose curative properties have brought about a large industry in shipping these waters to other States.

The increasing business and wealth of the State is strikingly indicated in the very remarkable increase in its banking capital and bank deposits. In 1880 the total National banking capital of the State was \$3,066,000 and the aggregate of individual deposits was \$6,690,447, whereas Virginia now has a total National banking capital of \$17,621,000, with individual deposits of \$90,329,822. The reason for this great gain in banking capital and deposits is found in the advance in the value of the products of factories, farms, forests and mines. The value of the factory products of 1912 was more than five times as great as in 1880; the value of agricultural products more than three times as great, of forests eight times as great and of mines seventeen times.

### VIRGINIA SUMMARIZED STATISTICALLY.

#### Land Area, 40,262 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	1,512,565	1,655,980	1,851,184	*2,100,000
Manufactures: ‡				
Capital .....	\$26,969,000	\$63,457,000	\$103,671,000	†\$216,392,000
Products—value .....	\$51,781,000	\$88,364,000	\$132,173,000	†\$219,794,000
Cotton Mills:				
Spindles active .....	44,340	94,294	126,827	411,092
Looms active .....	1,322	2,517	4,608	11,319
Cotton used, pounds .....	5,087,519	10,616,206	17,832,465	40,072,466
Cottonseed Oil Mills:				
Products, value .....	\$8,000	.....	.....	.....
Pig-iron made, tons .....	26,727	292,778	490,617	256,167
Coke made, tons .....	.....	165,847	685,156	*1,076,000
Lumber cut, feet .....	315,939,000	409,804,000	956,169,000	†1,359,790,000
Improved farm lands, acres .....	8,510,113	9,125,545	10,094,805	\$9,861,000
Farm lands, buildings, value .....	\$216,028,107	\$254,490,600	\$271,578,200	\$8530,918,000
Agricultural products, value .....	\$45,726,000	\$12,244,000	\$86,549,000	*\$157,340,000
Cotton crop, running bales .....	19,595	5,375	9,239	*25,000
Grain, bushels:				
Corn .....	45,230,000	36,922,000	28,184,000	47,520,000
Wheat .....	8,737,000	5,614,000	9,422,000	8,596,000
Oats .....	5,775,000	6,587,000	5,168,000	3,885,000
Livestock:				
Cattle .....	631,000	685,763	826,000	830,000
Sheep .....	497,000	495,313	693,000	781,000
Swine .....	956,000	796,691	946,000	880,000
Mineral products, value .....	\$1,263,039	\$3,274,178	\$5,658,801	*\$17,000,000
Coal mined, tons .....	43,079	784,011	2,393,754	*8,500,000
Iron ore mined, tons .....	26,727	543,583	921,821	*587,000
Railroad mileage .....	1,893	3,360	3,795	4,643
National Banks:				
Resources .....	\$14,348,362	\$24,751,895	\$39,058,368	\$161,092,193
Capital .....	\$3,066,000	\$4,236,300	\$5,171,000	\$17,621,000
Individual deposits .....	\$6,690,447	\$14,309,039	\$20,473,458	\$90,329,822
Other banks, deposits .....	\$7,757,202	\$13,767,424	\$22,451,581	\$53,067,070
Common school expenditures .....	\$946,109	\$1,604,509	\$1,989,238	\$8,408,000
Property, true value .....	\$707,000,000	\$862,318,000	\$1,102,300,000	*\$1,620,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910.

# WEST VIRGINIA

## THIRTY-TWO YEARS' PROGRESS IN PRODUCTION.

Value of Products of	1880.	1890.	1900.	1912.
<b>Factories...</b>	<b>\$22,867,000</b>	<b>\$38,702,000</b>	<b>\$74,838,000</b>	<b>\$195,000,000</b>
<b>Farms.....</b>	<b>\$19,360,000</b>	<b>\$20,439,000</b>	<b>\$44,769,000</b>	<b>\$99,828,000</b>
<b>Forests.....</b>	<b>\$4,053,000</b>	<b>\$9,191,000</b>	<b>\$17,690,000</b>	<b>\$39,979,000</b>
<b>Mines.....</b>	<b>\$2,485,000</b>	<b>\$8,433,000</b>	<b>\$47,055,000</b>	<b>\$106,000,000</b>

These figures, especially those for 1912 that are estimated, should be read in connection with the statements on page 93.



WEST VIRGINIA'S name naturally and readily brings to the mind's eye visions of great wealth as represented by vast deposits of coal, oil and gas, iron ore, building stones, limestones, clays, glass sands and cement rock; the extent and utility of its forests; the number of its health-giving mineral springs; the hydro-electric potentiality of its streams; the bracing quality of its atmosphere, and the rugged beauty of its scenery—for it is in respect of these that the State has become noted throughout the world. The riches of West Virginia in such things are indeed almost beyond the reach of computation, and their utilization during the past few years has brought the State from a position almost negligible in the scale of wealth to one of prominence. Yet they do not comprise all its potentialities for material progress, for West Virginia also has a combination of soil and climate that makes for great agricultural possibilities.

West Virginia is situated between 37° 10' and 40° 40' north latitude, and its climate is in a general way that of Virginia, Southern Kentucky, Maryland and Central Pennsylvania. But the character of the climate cannot be accurately told in degrees of latitude; its range of altitude must also be considered. At Harper's Ferry, on the extreme eastern boundary, the elevation is 260 feet; at the top of Spruce Knob, in Pendleton county, it is 4860 feet. The difference of almost a mile in altitude is approximately equivalent to the difference in temperature caused by 15° of latitude. This conveys some idea of the wide range of agricultural possibilities presented.

There are three well defined geographical divisions in West Virginia—the Ohio River division, the Mountain and the Potomac. The first comprises half the area of the State, and more than half its population. It takes in the fertile bottom lands along the Ohio River, the Great Kanawha and numerous smaller streams and the rolling, hilly country lying between them and the Mountain division. The altitude runs from 500 to 1500 feet. The lands are good for grains, grasses, fruit, truck and tobacco. The Mountain division extends from the low hills of the eastern border of the Ohio River division to the high plateau lands that top the Allegheny Mountains, containing all the eastern half of the State except that known as the "Eastern Panhandle." The elevation is from 1600 to 3000 feet, and some of the mountain peaks run to 4800 feet. Much of the division is still covered with forests, and there are wide areas of fine grazing land, together with much that is adapted to general agricultural and fruit-growing purposes. The Potomac or Eastern Panhandle division is comprised of the counties of Jefferson, Berkeley, Hampshire, Morgan, Hardy, Grant and Mineral. Parts of the four western counties of this group are marked by high ridges, but the valleys are wide, and in climatic as well as topographic conditions the section differs widely from the western portion of the State. It includes an area of 2000 square miles and has a population of approximately 125,000. It is a rich limestone farming section and one of the great fruit belts of the State—a section of highly cultivated fields, of thrifty orchards and comfortable, hospitable homes. It ranges in elevation from 260 to 1500 feet.

The soils of West Virginia are of two general classes—alluvial and sedentary. The alluvial soils have been formed in the valleys by the overflow of the streams and the silt from adjacent hills. They are highly fertile and with good cultivation produce abundant crops. The sedentary soils have been formed by the disintegration of the underlying rocks, and vary in character with the nature of the rocks themselves. They are composed of the various limestones, sandstones and shales, and run from a moderate to a high degree of fertility, but are all easily made productive by proper treatment.

West Virginia is an excellent grazing State, the hillsides covered with blue grass and watered by streams of pure water forming ideal pastures. The mild winters allow grazing throughout nine months in the year, and in the chief cattle-raising counties the herds are carried through the winter on hay alone, the choicest export beef being sent to the market without having been fed a pound of grain. The same conditions that make for success in raising beef offer a profit in dairying, and the local markets of the State are capable of taking up much larger amounts of dairy products than are now produced there. A number of West Virginia counties, notably those of the "Northern Panhandle," are peculiarly suited to sheep growing, having the Permian limestone soil that produces the finest quality of wool. Corn produces well where properly cultivated, and wheat is profitably grown in some of the counties. In many parts of the State, and especially in the Ohio River bot-

oms, trucking is carried on with marked success, the soil being well adapted to the production of vegetables of all kinds, and the markets throughout the mining sections and the various towns being such that good prices are obtained at all times. It will be many years before the local demand is met by local production, and therefore opportunities are many for those who desire to engage in small farming and gardening.

In many sections, but especially in the Eastern Panhandle, conditions of soil and climate are highly favorable for the growing of fruit, and numerous companies and individuals are engaged in raising apples and peaches on a large scale. Berkeley county leads the State in the production of apples and Hampshire county in the production of peaches, but the nearby counties are producing large quantities also. Two West Virginia counties and two contiguous counties in Virginia are, it is claimed, producing more apples than the States of Washington and Oregon combined. These fruits have become very popular in the big markets and always find ready sale at good prices.

In a tier of counties in the southwestern portion of the State the growing of tobacco has been extensively engaged in during the past few years, and the annual product has grown to many million pounds. The sales in Huntington alone aggregate 20,000,000 pounds or more yearly, and there are other markets of greater or less extent throughout the tobacco-growing region.

The land area of West Virginia is 24,022 square miles, or 15,374,080 acres. Of this there is a very large amount still in virgin forests, while the coal area of the State is 17,000 square miles, equal to the combined coal area of all Europe, excepting Russia. It is estimated that this area originally contained 150,000,000,000 tons of coal, of which about six-tenths of one per cent. has been mined. The output of the State in 1912 was 67,000,000 tons, or about 50 per cent. more than the total bituminous coal output of the United States in 1880. At the rate at which it was mined in 1912 the supply would last 2500 years. The coal is bituminous, with here and there considerable pockets of cannel coal. In some sections the coal is especially adapted to coking, in others to gas making, while much of the coal of the State is of great excellence for steam and domestic purposes. The coal area extends through a large portion of the State. Though this State is now mining 50 per cent. more coal than the United States mined of bituminous coal in 1880, this industry is but in its infancy of development, and its coke industry promises to grow in keeping with the output of coal. West Virginia ranks second in the country in coke production.

The first successful drilling for oil was at Burning Springs, in Wirt county, in 1860. The wells were in the shallow sands and, though some of them were fairly good producers, they were short lived. For the past 20 years or more drills have been sent into the deeper sands, and wells of much greater production and of much longer life have been struck in various fields. The production in 1911 was 9,795,464 barrels, valued at \$12,767,293. In amount of production, the State stands fifth; in value of product, fourth.

In the production of natural gas, West Virginia stands first, with 297,112,576,000 cubic feet in 1911, valued at \$28,451,997. A very large proportion of this is piped outside the State and used for lighting, power and fuel elsewhere. A number of cities in the State, however, use it in lighting, the development of power and as fuel for various manufacturing purposes. It is notably used thus in Wheeling, Wellsburg, Sistersville, Morgantown, Fairmont, Clarksburg, Grafton, Parkersburg, Huntington and Charleston. It is so convenient as a fuel that where obtainable at reasonable prices it has almost altogether supplanted coal. Vigorous efforts are now being made to develop manufactures using gas as fuel in order that the potential wealth of this resource may be made to enrich West Virginia instead of other States to which this gas is now piped. By reason of the abundance and cheapness of its gas, the variety and extent of its raw materials for manufactures and the exceptional strategic location of the State as relates to the great consuming markets of the country, it is altogether probable that there will be in the near future a very rapid growth of industrial interests in this State.

The Oriskany and Clinton iron ores are found extending almost entirely across the counties of Hampshire, Hardy and Pendleton, and to some extent in Mineral, Morgan and Grant. They run from 35 to 60 per cent. metallic iron, and must come into extensive use, as the demand for iron and steel increases with the growth of population and the development of the country.

The Oriskany and Medina white sand stones, which furnish a high quality



of glass sands, extend for many miles through Morgan and adjoining counties. They are now being largely used from quarries near Berkeley Springs, and will unquestionably be much more extensively used in the near future, as they make glass of the finest quality.

Limestones are found in many counties, some of them being of the highest character. Developments have been made in numerous places, the largest being in Berkeley county, about Martinsburg. The deposits there are of such a high degree of purity that they are much used as a flux for iron ore in the furnaces of Pittsburg and elsewhere. Quarries located about Martinsburg are also taking out large quantities of the stone for use in making lime and cement and likewise for road construction. A big modern plant for the manufacture of hydrated lime is located there, and one of the most modern plants in America for quarrying limestone for fluxing with a capacity running into thousands of tons daily has lately been completed.

Together with these vast deposits of limestone the State has excellent clays and shales, thus furnishing the complete tale of ingredients for the making of Portland cement. These are found in many portions of the State.

Excellent clays for pottery, brick and general refractory purposes are found in various sections of West Virginia, and brick and tile are made in numerous localities. There are large potteries in the Northern Panhandle counties and smaller ones in other sections. Considerable quantities of sewer pipe are also made in the State. The value of the brick and tile made in 1911 was \$1,453,218; that of the pottery \$2,880,202. The State has risen from sixth to third place in pottery production since the development of its natural gas fields. Glass making has become an important industry also following the gas development, and there are now many glass factories located at various points throughout the gas-producing territory.

West Virginia has building stones of many kinds equal in quality, color and strength to the best found elsewhere, but as yet little has been done to develop them.

Strong salt brine is found in a number of places throughout West Virginia, and the business of salt making was formerly carried on quite extensively. Most of the salt plants were in Kanawha county on the Great Kanawha and Mason on the Ohio. Some of them have been forced out of business by a combination of circumstances, and now in all the State there are but a few in active operation. The saltwater is still there, however, and the time will doubtless come when the once prosperous salt-making business will be taken up again.

West Virginia, with its mountainous topography and never failing streams, provides many opportunities for the development of water-power. There are as yet very few such developments, though several of large importance are now being carried out. Notwithstanding the abundance of coal and gas, it is believed that the vast powers on the rivers of the State will ultimately be fully utilized. In the Bluefield section, though the dams are on the Virginia side, about 100,000 horse-power is being developed and much of this

will be used for lighting and power purposes in the operations of the coal mines in that region. Another large development is being made on the Cheat River to furnish hydro-electric power to traction enterprises in Pennsylvania, while in the Cabin Creek section some millions of dollars are to be expended in several very large hydro-electric operations. It is confidently expected that the water-powers of this State, which are of very great extent, will be fully utilized as in these cases.

Six great railway trunk lines enter West Virginia—the Baltimore & Ohio, the Chesapeake & Ohio, the Norfolk & Western, the Virginian, the Western Maryland and the Wabash. Four of these—the Baltimore & Ohio, the Chesapeake & Ohio, the Norfolk & Western and the Western Maryland—cross the State from east to west, and with their branches radiate through it in many directions. There are in addition to these some 30 or 40 local roads, the whole forming a network of transportation lines that give almost every section of the State intimate connection with the largest centers of population and commerce in the country and through ocean connections with all the world's ports. The Ohio, the Great Kanawha, the Little Kanawha, the Monongahela and the Big Sandy are all navigable streams, thus completing facilities for transportation not frequently equaled.

West Virginia has an up-to-date public school system, upon which it spends \$4,000,000 a year. It is one of the few States in which the law requires agriculture to be taught in the common schools. The public school system embraces six normal schools and a university of high standing, and is supplemented by a number of other institutions of college rank.

It is said to have the largest pottery, the largest glass factory, the largest drug and extract factory and the largest stogie factory in the United States; the largest axe factory and the largest independent tin-plate mill in the world.

The State has many mineral springs and scores of summer resorts in the mountains, to which health and pleasure seekers resort from all over the country.

Owing to its varied character of soil and climate, its resources of raw materials, its possession of vast supplies of cheap fuel, coal, oil, gas and water-power, and its fine transportation facilities, West Virginia offers innumerable opportunities to the manufacturer, the miner, the farmer, the fruit grower, the cattle grower, the merchant and the investor. It is a State of almost limitless resources in the infancy of their utilization.

The progress already made by the State is only indicative of what will be seen in the future. In 1880 the combined output of the factories, farms, forests and mines of the State aggregated in value less than \$50,000,000. Last year the value of the mineral output alone was more than double this, as was the value of agriculture, while the factory product of the State was nearly four times as great. That is a record of growth hard to match, but the future promises to show a progress which will far surpass these totals, though the percentage of gain may somewhat decline as the magnitude increases.

#### WEST VIRGINIA SUMMARIZED STATISTICALLY.

##### Land Area, 24,022 Square Miles.

	1880.	1890.	1900.	1912.
Population .....	618,457	762,794	958,800	*1,293,000
Manufactures: ‡				
Capital .....	\$13,883,000	\$28,118,000	\$55,904,000	‡\$150,923,000
Products—value .....	\$22,867,000	\$38,702,000	\$74,838,000	‡\$161,960,000
Pig-iron made, tons.....	62,802	129,437	166,758	274,360
Coke made, tons.....	138,755	833,377	2,358,499	*3,000,000
Lumber cut, feet.....	180,112,000	299,709,000	773,583,000	‡1,387,786,000
Improved farm lands, acres.....	3,792,327	4,554,000	5,498,981	\$5,482,000
Farm lands, buildings, value.....	\$133,147,175	\$151,880,300	\$168,295,670	\$§262,458,000
Agricultural products, value.....	\$19,360,000	\$20,439,000	\$44,769,000	*\$99,828,000
Grain, bushels:				
Corn .....	17,307,000	13,435,000	19,300,000	24,370,000
Wheat .....	5,131,000	2,326,000	4,453,000	3,262,000
Oats .....	2,412,000	1,506,000	2,769,000	3,058,000
Livestock:				
Cattle .....	446,000	536,700	640,000	561,000
Sheep .....	675,000	785,063	969,000	838,000
Swine .....	511,000	411,018	443,000	363,000
Mineral products, value.....	\$2,484,699	\$8,433,219	\$47,055,384	*\$106,000,000
Coal mined, tons.....	1,829,844	7,394,654	22,647,207	*\$66,700,000
Iron ore mined, tons.....	62,802	25,116	**	**
Petroleum, barrels.....	179,000	492,578	16,195,675	11,800,000
Railroad mileage.....	691	1,433	2,485	3,937
National Banks:				
Resources .....	\$5,939,454	\$9,232,291	\$25,242,824	\$82,037,491
Capital .....	\$1,861,000	\$2,176,000	\$3,849,660	\$9,760,000
Individual deposits.....	\$2,040,126	\$5,262,209	\$15,548,823	\$51,815,650
Other banks, deposits.....	\$4,034,743	\$3,938,249	\$21,317,823	\$62,071,555
Common school expenditures.....	\$707,553	\$1,198,493	\$2,009,123	\$§4,094,000
Property, true value.....	\$350,000,000	\$438,955,000	\$659,600,000	*\$1,200,000,000

\*Partly estimated. ‡Not including neighborhood industries and hand trades in 1909. †Figures of 1909. ‡Figures of 1911. §Figures of 1910. \*\*Included in Kentucky.

## Unfolding the Panorama of the South's Activities

In the Following Advertising Pages Hundreds of Contributors  
Unite in Making Known

Specific Illustrations of the Resources and Potentialities  
of the South



MOVING panorama, thrilling with interest, is unfolded in the pages which follow, wherein will be found interest-compelling articles dealing with the material activities of the South.

In the preceding pages we have attempted to present a bird's-eye view of the South as a whole, of its vast and varied resources, of its progress in the past, and to forecast something of its future.

That is the work which the editors of the MANUFACTURERS RECORD and the specialists who have contributed to this issue have undertaken to do.

In the following pages specific facts and concrete illustrations are presented of individual towns and cities and of industrial and railroad operations, emphasizing in this way the reality of the things that have been told broadly in the preceding pages.

Never before, we believe, in any publication issued in this country has there appeared such a vast amount of information specifically emphasizing by individual activities the wide range of Southern development and the astonishing growth of Southern cities. In these pages there will be found a wide variety of information, much of it as interesting and valuable to the student of Southern conditions as the array of facts and figures presented by editorial writers and experts of the highest standing in the preceding pages.

Broad generalizations about the South and its potentialities here find overwhelming proof in stories of thrilling interest dealing with specific activities.

Here are facts regarding many of the most advantageously located and most prosperous towns and cities of the South; here are facts which tell of enormous expenditures in the development of water-powers, of great industrial enterprises whose success is indicative of the opportunities presented in the South; facts about great reclamation undertakings showing how the 50,000,000 acres of wet lands of the South are to be redeemed and made available for man's use, adding billions of dollars to the wealth of this section and of the nation; facts about novel features in connection with interurban railway operations; facts about great railroad enterprises and their meaning to the nation, and facts about other operations typical of the possibilities in this section.

It is, however, impossible to catalogue the things that can be found in the following pages of vital interest to every man. These pages should be studied with care. They contain a wealth of information vitally important to everyone in any way connected with the advancement of the South or who seeks information about this section.

In the displayed advertising pages which follow the Descriptive Advertising Section are the announcements of hundreds of the foremost financial, industrial and railroad concerns located in the South or seeking business in the South. These pages, too, are equally interesting, for they cover the widest range of activities, and they, too, are typical of the influences at work for Southern advancement.

This publication through the years to come will add hundreds of millions of dollars to the wealth of the South and turn the thought of hundreds of thousands of people to this section. Every advertisement in it, from the small \$10 card to the 10-page story, is a factor in making this issue possible and to that extent in making known to the world the resources and the advantages of the South.

These advertisers are doing more than merely seeking to present their own specific announcement, whether that be of a bank or a town, for on a broader view than exclusively for their own individual prosperity they are united in a great campaign for hastening the coming of the day when abounding prosperity shall prevail in every line of human activity throughout the South. It is, however, meet that every one of these advertisers should receive from the people of the South, and others interested in the South, due recognition for their co-operative work in this broad campaign for Southern upbuilding. Through these pages they rightly express the living, breathing reality of Southern energy and Southern activity.

And when the reader seeks further information from any of these towns or cities or business organizations, and every one of them will be glad to co-operate in broadening the knowledge of the South, we trust that mention may be made of the fact that the advertisement was seen in this section of the MANUFACTURERS RECORD entitled "The South: The Nation's Greatest Asset."





THE RISING SKY LINE OF BIRMINGHAM

## Birmingham, Alabama—The World's Most Richly Endowed Industrial Center



F Birmingham and the resources on which Birmingham is founded did not exist, it would not be possible for this publication to be entitled "The South: The Nation's Greatest Asset," for without Birmingham and the mineral wealth of this district the name would be a misnomer. Outside of the dominating power of the South's cotton in world affairs, the one great, striking feature of the South which makes it the nation's greatest asset is the remarkable combination of coal and iron and limestone in such vast quantity and so close together that much of it is within rifle shot, which gives to Birmingham, and thus to the South, a strategic position in the world's iron and steel interests unlike that held by any other country in this or any other land. Far back in the dim past, accredited by some to Croesus himself, the statement is said to have been made that "he who has the iron will get the gold." Edward Atkinson, the distinguished political economist of New England, stated the same truth in another way, when years ago, writing about the iron-making possibilities of the South, he said:

"That country or that section of country which can produce iron at the lowest cost will dominate the commerce and trade of the world."

Abram S. Hewitt, one of the greatest metallurgists which America has produced, a man whose judgment on all questions relating to iron and steel always carried conviction throughout the business world, ten years ago, when Birmingham had successfully established its first basic steel-making plant, said:

"The growth of the basic steel industry, now that it has been fairly started in the South, ought to be very rapid. That section with its abundant stores of ore and coal and limestone in such close proximity as is found in Alabama bids fair within the next quarter of a century to dominate the basic steel industry of the world."

Many years ago Col. A. K. McClure, the distinguished editor of a Philadelphia paper, after a close study of the iron-making potentialities of the Birmingham district, wrote:

"It is idle for Pennsylvania and other great iron and coal-producing States to close their eyes to the fact that we have reached the beginning of a great revolution in those products. No legislation, no sound public policy, no sentiment can halt such a revolution when the immutable laws of trade command it, and the sudden tread of the hordes from the Northern forests upon ancient Rome did not more certainly threaten the majesty of the mistress of the world than does the tread of the iron and coal diggers of Alabama threaten the majesty of the iron and coal fields of the North. \* \* \* These lessons come upon us plain as the noonday sun, and it is midsummer madness not to read them understandingly. We cannot war with destiny; we cannot efface the beneficent gifts of Him who leads the waters to the sea and sends them back in the dews and rains of heaven. Alabama has been gifted far beyond even our boasted empire of Pennsylvania."

Hon. John R. Proctor, for many years State Geologist of Kentucky, and subsequently president of the United States Civil Service Commission, a man of profound scientific attainments and broad business knowledge, basing his statements on years of investigation and study of the South's resources with special reference to iron and steel, said:

"The rapid strides made in the manufacture of steel in Germany by the basic processes, and the increase there of manufactures based on steel, demonstrate what may be expected in the South, where the conditions for the cheap production of basic steel are far more favorable than in Germany. For years the patents on these processes were in the control of the manufac-

turers of Bessemer steel, but now that these patents have expired and it has been demonstrated by the extensive steel works at Ensley, near Birmingham, that a superior steel can be produced at a low cost from Southern ores, we enter upon a new era of steel-making in this country, and we may confidently expect in the not distant future that Southern steel will dominate the markets as Southern iron has done during the past decade. Following the cheap production of steel must come the establishment of industries in the South convenient to the furnaces and steel plants, and cheap coals and cokes for the production of structural steel, bridges, etc. Southern steel will have a freight advantage over the Bessemer steel of the Lake region for export, and for the markets of our Atlantic States and the great Southwest."

"The South holds absolute command of the four great staples—the potential basis of a marvelous development in the future—coal, iron, steel and cotton."

In taking note of Alabama's advantages for industrial advance, it is to be observed that Alabama will command three of these great staples—coal, iron and steel, while at the same time she has an equal opportunity with any other section of the South for cotton production and manufacture, and thus there is the foundation in Alabama for wealth-creation of unequalled scope.

Other experts who have investigated this district have with equal enthusiasm told of its predestined future as one of the world's greatest iron and steel centers. For a long time conditions were unfavorable for the largest development of the wealth of this district. The greatest iron enterprise in Alabama was for many years hampered by a lack of capital and used more as a football for speculative operations in Wall street than for legitimate development. Like all other new districts lacking ample capital, the iron-making interests of Birmingham had for many years to make an up-hill fight against heavy odds. They lacked the money to build the most modern and up-to-date plants and the money with which to secure the highest technical skill. In this respect these interests were tremendously handicapped compared with the older iron-making districts of Pennsylvania and the West. In the days when Mr. Carnegie was the iron and steel king of America, the question was often asked why, if Birmingham had the advantages claimed for it, did not Mr. Carnegie invest in this district? As a matter of fact, Mr. Carnegie was so busily absorbed in the development of his Pittsburgh interests that in those days he had neither time nor the available spare capital to undertake new enterprises elsewhere. Later on, when the Steel Corporation succeeded Mr. Carnegie, the question was again asked why, if Alabama has been so marvelously blessed by nature as the experts said, does not the Steel Corporation enter that district? Again the answer could have been made that the Steel Corporation for the first few years of its existence was taxed to the utmost of the ability of its managers and its ready capital to reconstruct and modernize its vast and widely scattered plants in order to bring about results which would justify its enormous capitalization. But the Steel Corporation is now in Birmingham. It has backed its faith in this district by an investment, including the bonds on the property bought, of about \$60,000,000. Since it purchased the Tennessee Coal, Iron & Railroad Co., whose operations are confined almost wholly to this immediate section, it has expended in the Birmingham district in development work, in the betterment of its plants and the enlargement of their operations between \$15,000,000 and \$20,000,000. Many millions more will have to be expended before the great plant of this company has been rounded out to justify the investment already made. Experts estimate that the iron ore tonnage owned in this district by the Steel Corporation through its ownership of

the Tennessee Coal, Iron & Railroad Co. amounts to from 600,000,000 to 800,000,000 tons, and that it owns over 2,000,000,000 tons of coal. This is as much iron ore, and far more coal, than the Steel Corporation owned when it was first organized.

In the last year or two this district has received the benefit of the large investments made by the Steel Corporation and by the Woodward Iron Co. in building by-product coke ovens, the outlay by these two companies for these improvements being upwards of \$4,000,000. The construction of these by-product ovens has completely changed the whole situation, enabled them to produce coke at a much lower cost than heretofore, and greatly reduced in this way the cost of iron-making, and the outcome of the by-product coke plants has been the development of various other interests utilizing some of these by-products.

When Mr. Hewitt made his statement that Alabama would dominate the basic steel industry of the world, basic steel was not so important a factor in the world's metallurgical interests as at present. In recent years, owing to the superior quality of the basic over the Bessemer steel, the demand of the country has been for basic rather than for Bessemer rails. Under this condition there has been a rapid decline during the last few years in the production of Bessemer rails, and an equally rapid increase in the output of basic rails. The figures are interesting:

	Tons.	
	Bessemer.	Basic.
1905.....	3,192,347	183,264
1906.....	3,791,459	186,413
1907.....	3,380,025	252,704
1908.....	1,349,153	571,791
1909.....	1,707,171	1,256,674
1910.....	1,884,442	1,751,359
1911.....	1,053,420	1,676,923

In 1911 the production of Bessemer rails was not one-third as large as in 1905, while the output of basic rails in 1911 was nine times as large as in 1905. That tells the story of the change from Bessemer to basic rails.

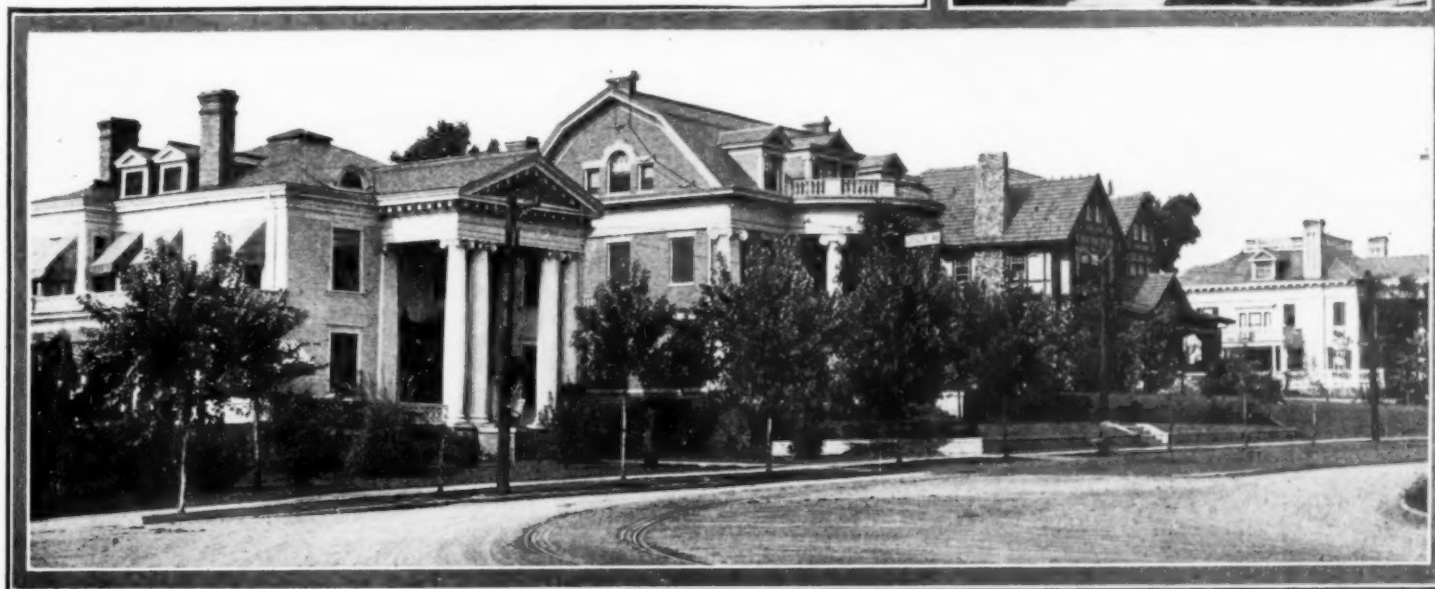
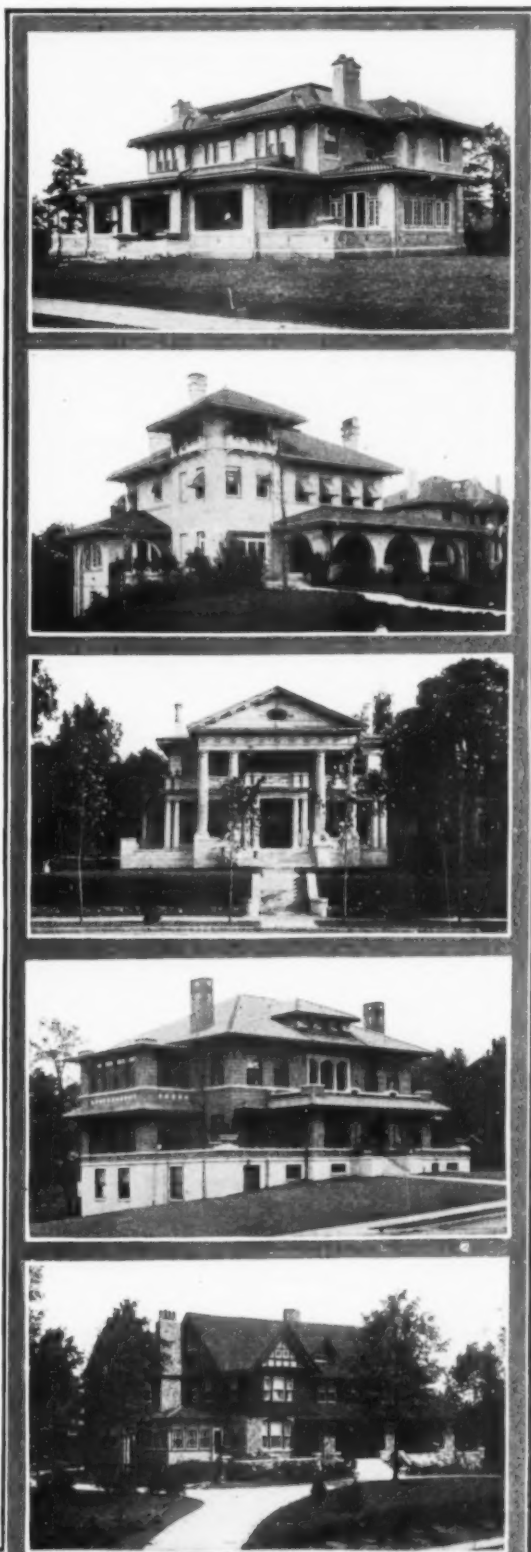
So long as Bessemer steel had the call on the world's trade, the steel-making interests of the North and West, due to their supply of Bessemer ores from Lake Superior, had a very great advantage over the South. When the change took place and basic steel became the dominant steel of the world, that advantage was wiped out and Southern ores were immediately placed on a parity with the ores of the North. It is today conceded that no better rail is made in the United States than that produced in the Birmingham district. The superiority of the basic rail over the Bessemer rail is now universally conceded, and not only Southern railroads, but the railroads of other sections, as well as foreign roads, are demanding the basic rail and Birmingham gets the benefit of the change. Two or three years ago, during the time when the demand for rails was inactive in this country because of shortage in railroad building, the Birmingham plant of the Steel Corporation sold over 100,000 tons of rails for delivery to Argentine and other South American countries in competition with the rail-makers of the world.

From the day when the basic rail superseded the Bessemer rail an entirely new era was opened for the whole Birmingham district, and the fulfillment of Mr. Hewitt's prediction came visibly into sight.

Much has been said of the enormous ore and coal resources in this district owned by the Steel Corporation. That company, however, fortunately for itself and for the country, owns no monopoly of Birmingham ore and coal properties. Independent iron companies and iron-ore owners own a very much larger amount of iron ore in the aggregate than that owned by the Steel Corporation. Recent diamond drilling operations have demonstrated an enormous supply of high-grade red ore adjacent to Birmingham not heretofore definitely known, though experts believed it would be found. These drillings showed that this ore field extends over a much larger territory than had heretofore been proven up, thus probably doubling the known available ore of this immediate section.

The State of Alabama has more than 8000 square miles of coal land. England, with its annual production of about 250,000,000 tons, has a little less coal area than the one State of Alabama. The entire coal development of this enormous area must forever be tributary to Birmingham and add to Birmingham's wealth.

Nowhere else, so far as mankind knows, is there to be found so vast a quantity of iron ore and coal and limestone in such close proximity as in this district. Here nature has made a unique condition. Here nature has predestined, by the very magnitude of the resources with



TYPES OF BIRMINGHAM RESIDENCES





SOME BIRMINGHAM HOTELS AND APARTMENTS NOW IN COURSE OF CONSTRUCTION.

which it has endowed this section, that there shall grow up one of the greatest metallurgical centers that the world has ever seen.

#### BIRMINGHAM'S STRATEGIC ADVANTAGES.

Every baby born in the Southern States, every settler locating in this section, every new wheel that turns on rail or in factory, every new acre of land put under cultivation, or every old acre improved by better cultivation, inures to the benefit and progress of Birmingham. That is a broad statement, but it is susceptible of proof.

Every advance made by this section in wealth and trade and industry enlarges the demand for iron and steel, and this demand must by the very nature of the economic forces existing in this district increase the demand for Birmingham-made iron and steel with all their widely ramified products.

Birmingham can increase its output to meet the ever-expanding demand which will come from the growth of the South in wealth and population, in industry and in agriculture. It can increase its iron and steel for the enlarged demand for machinery and steel rails and cars and locomotives and other things that will come by reason of these conditions.

There must be an enormous expansion in railroad building throughout the South.

Birmingham is in a position to supply the rails.

Locomotives and cars and track supplies of all kinds will be needed in ever-increasing quantity.

Birmingham has the raw materials out of which to make them.

City building activities will result in the erection of hundreds of office buildings, hotels and warehouses, necessitating an ever-increasing consumption of architectural iron, of engines and boilers, and of other things that enter into such work.

Birmingham has the raw materials out of which to supply these needs.

The opening of the Panama Canal will vastly enlarge the opportunities for furnishing iron and steel to Central and South America and to the west coast of the United States.

Naturally and inevitably this trade must be centered in Birmingham.

It should not, however, be considered that Birmingham is wholly dependent on iron and coal and steel. These resources are vast enough to enrich an empire and to form the foundation on which to build one of the greatest cities of the world.

But if Birmingham had neither coal nor iron nor limestone, it would still have advantages sufficient to justify the building of a big city.

Birmingham is in the heart of a cotton-growing State, which produces from 1,200,000 to 1,700,000 bales of cotton a year.

It is surrounded by one of the most fertile regions of the country, yielding largely of almost every agricultural product of the temperate zone—corn, and wheat, and oats, and grasses, and fruits and vegetables of almost every variety.

It has great cement-making resources and is a large producer of high-grade Portland cement.

It has clays of unusual excellence for the manufacture of every grade of brick and other clay-working interests.

Birmingham-made brick command the market for quality over a large territory.

Birmingham is ideally located for the manufacture of cotton goods, and

has a flourishing cotton industry, and for a wide variety of diversified manufactures from the making of cotton gins and the engines with which to run them to the building of automobiles.

The development of the banking interests of this city is indicative of its general progress. There are a dozen banks and trust companies operating here with an aggregate of capital, surplus and undivided profits of nearly \$7,000,000, and with deposits of \$25,000,000.

In 1900 the total bank clearings of the city amounted to \$43,980,448; by 1910 they had grown to \$130,248,528, while in 1912 the aggregate for the city exceeded \$150,000,000, largely more than trebling the clearings of 1900.

Birmingham is a great center for travel. Its busy depots, with constant throngs of in and outgoing passengers, are indicative of the life and spirit of the community.

Two hotels costing over \$1,000,000 each, and several large apartment-houses of the most modern construction, are now being built to meet the increasing demand from the traveling public.

#### CLIMATIC, SCENIC AND HOME ATTRACTIONS.

Climatic advantages and beauty of scenery are among the assets which add immensely to the potentialities of this district. Even the rugged mountains of Western Carolina, with all their glory of scenery, are not more beautiful; nor do they afford more awe-inspiring views than can be had from the mountains immediately surrounding Birmingham. In the valley in which Birmingham is located, and on the surrounding hills and mountains, are to be had climatic advantages not surpassed by those of the noted health regions of the world.

Birmingham is noted for its magnificent homes and their splendid architecture, and for its many office buildings; and yet so great is the demand for office room that the best buildings constantly have a long waiting list of applicants; it is noted for its magnificent church buildings, for its schools and for many other things that combine to make it an ideal place for a home and for doing business. Consult the Chamber of Commerce and you will learn many things of interest and many reasons why it is the place for your investments for branch factories or warehouses or offices of existing plants in other sections, and why it is pre-eminently the place in which to live and establish yourself in manufacturing, mining or commercial pursuits.

Great industrial centers are not always favored by nature with advantageous locations for homes. Birmingham, however, is exceptionally blessed in this respect. Writing of this city from that point of view, the editor of the Manufacturers Record last year said:

"There is probably no other city in America of equal population which has more, or more splendid homes. The residence section is a marvel of beauty, in landscape engineering, in the excellence of its streets and in architecture which ought to be studied by every architectural student in the country. As a residence city, Birmingham's magnificent Highlands, where views of surpassing beauty can be had, is equaled by few cities in any land. Climbing these Highlands by gradual steps of winding roads or well-made streets, as one rides along the crest or the side of the mountain he gets views which can scarcely be surpassed by the wonders of the North Carolina mountains. In less than a half-hour's motor ride up a fine road one reaches Shades Mountain. Here, for mile after mile, are views claimed by some travelers to be as beautiful as anything in Switzerland or other scenic regions of the world. In this mountain region, with its fine summer climate and its marvelous views, the city has an asset worth untold millions. It is an asset as dependable and as real as the iron ores beneath Red Mountain."

# The South's Broadest Hydro-Electric Development

## English and American Capital United in Alabama's Upbuilding



THE UNITED STATES is the most richly endowed country in the world, with resources that have made it the envied of every other nation.

The South is the most richly endowed section of the United States; indeed, its unequalled resources entitle it to be called the nation's greatest asset.

Alabama is the most richly endowed State of the South.

It is the very center and heart of the South, with a combination of advantages surpassing those of any other State in the Union.

It is larger in area by 6000 square miles than Pennsylvania.

It has 1400 square miles of coal land more than England.

It possesses what geologists believe to be the greatest combination of coal and iron ore, considering quantity and proximity, of any region in the world.

As a cotton-growing State it has no superior, though two other States exceed it in the aggregate yield by reason of the larger acreage which they devote to cotton.

It is unique among all the States of the South and of the country. Indeed, it is unique among all the lands of the earth.

Nowhere else can be found such a remarkable combination of coal and iron and limestone, marbles and other minerals in a land so wonderfully endowed with agricultural advantages for the production of cotton, corn, wheat, fruits of every variety, with climatic advantages as rare as is its combination of minerals, timbers, water-powers and soil.

It is of more than national interest; indeed, it is of international importance that some of the great financial forces in the money center of the world—London—recognizing Alabama's pre-eminent advantages and its predestined greatness in all that makes for material progress, have joined their command of investment capital with Alabama's resources.

This brings into the active development of what it is conservative to say is the most richly endowed State in the world some of the great creative, upbuilding, financial powers of the richest city in the world.

England thus finds for its investment capital a field of unequalled attractiveness.

Alabama, through this union, finds a source of great capital to make available some of its vast resources.

Through the banking-house of Sperling & Co. of London, which has for some years placed English money to the extent of about \$50,000,000 annually in foreign investments, there has been organized the Alabama Power Co., whose first issue of securities was brought out by Parr's Bank, Limited, one of the largest and most conservative banking institutions of Europe.

The Alabama Power Co. has a capitalization of \$55,000,000, and the organizers of the company expect to see this full amount ultimately expended in the development of its properties, and even more than this brought into the State through the wide ramification of its operations for the development of industrial interests of many kinds. The company controls an aggregate of several hundred thousand horse-power, which it purposes to develop as rapidly as feasible for hydro-electric operations. It is now developing one power on the Coosa River at a cost of about \$10,000,000, and construction work is being pushed rapidly as possible. This will provide 105,000 horse-power. It has built at Gadsden a supplementary steam power plant. It has secured control of a number of public service corporations, and interests identified with it have become large owners in the stock of a company which controls other public utilities in Birmingham and other leading cities in Alabama, and some other Southern States.

In view of these interests identifying the company with many lines of activity in the State, and of the truly remarkable industrial progress of Alabama, it is quite safe to say that the entire available power owned by the company will be needed to meet the demands already existing and those which will be created by the industrial and general business development now under way.

That such strong financial interests in England have undertaken the investment of such large capital in Alabama, and that they have been fortunate enough to select a State of such limitless resources, is a matter of concern to the whole country as well as to all investors in England seeking to know the best place in the world in which to put money.

The financial interests back of this undertaking have not gone out into the wilds of undeveloped countries, nor taken up a pioneering project of doubtful safety, but they have gone to the very heart of America, into a region thrilling with industrial activity, and secured control of water-power interests, the development of which is fully understood from every point of view as one of

the safest and soundest investments that can be made under such conditions.

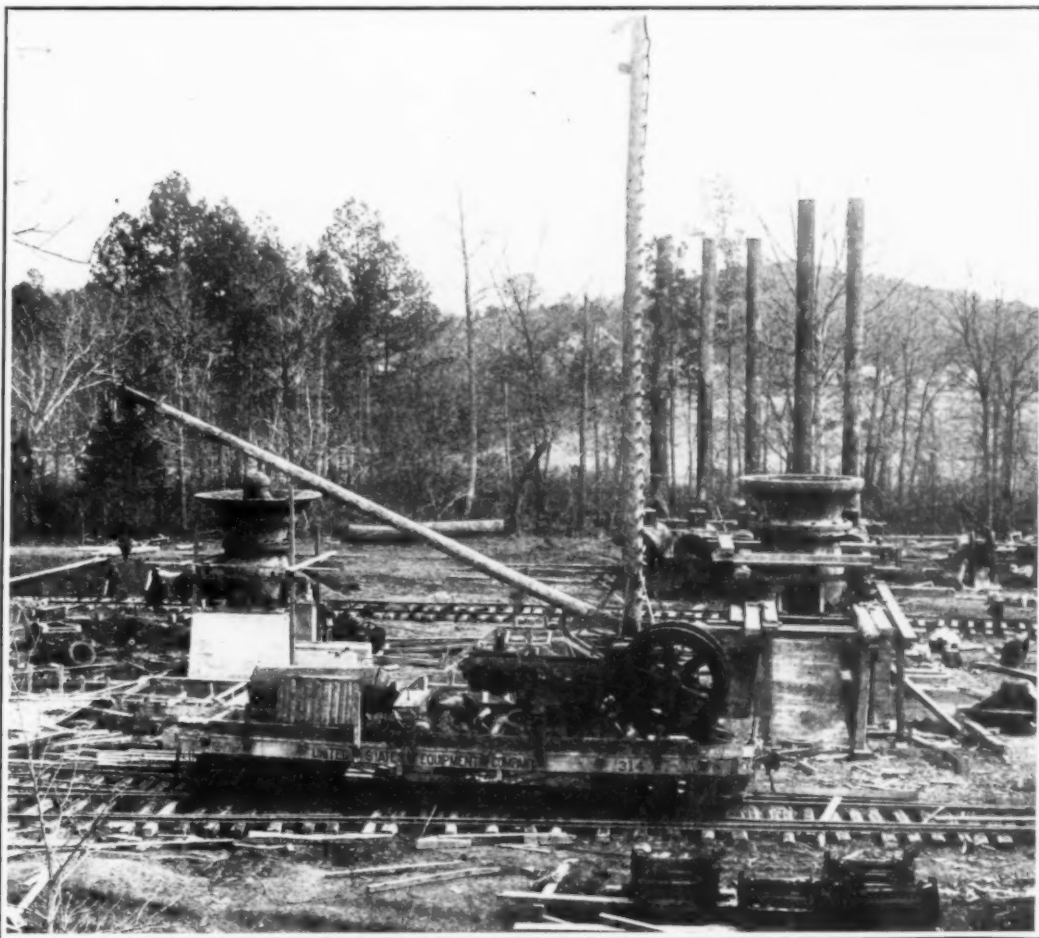
One of Alabama's great charms is its climate: on the Gulf coast it is soft and balmy, while in the higher altitudes of the Piedmont section, ranging from 800 to 1200 feet on up to the mountains, can be found climatic conditions meeting every requirement of man. On the Gulf coast the almost semi-tropic warmth makes possible the cultivation of semi-tropical fruits and of early vegetables for Northern and Western markets. In the Piedmont section, with its range of altitude from about 800 to 1200 feet, the climate is dry and bracing, exhilarating to a degree, and in itself is an asset of untold advantage to the State. Here is found freedom from the bitter cold of winters in the Northern regions of the country, and a balminess and

dryness in the summer which make that section an attractive summer resort. Health conditions throughout the State are exceptionally good.

This State, therefore, has a combination, or a concentration of advantages in its climate, in its widely diversified soils which make possible the widest diversity of agriculture, and in the marvelous wealth of its minerals, probably equaled nowhere else. It is predestined to fulfill the prediction of the late Abram S. Hewitt, one of the world's greatest metallurgists, who ten years ago said that within a quarter of a century Alabama would dominate the basic steel industry of the world.

With its cotton crop ranging from 1,250,000 to 1,700,000 bales a year, and surrounded by other cotton-growing States, Alabama has rare advantages for the manufacture of cotton goods from the coarsest fabric to the finest. The strength of its position in cotton manufacturing was illustrated a few years ago when two of the oldest and largest cotton manufacturing concerns in New England, after a thorough investigation by experts of the whole South, selected Alabama as a site for mills in which they have invested about \$4,000,000, one being located near Gadsden and the other at Huntsville. With the whole South open to their investigations, these two great and successful New England concerns placed their stamp of approval by these investments upon Alabama as the best location in their opinion for the establishment of cotton mills.

It is universally accepted as a fact that the iron and steel-making resources of Alabama are superior to those found elsewhere in this country. Its resources have been persistently exploited before Congressional committees as so great as to insure its becoming one of the world's greatest metallurgical centers.



ROCK CRUSHING PLANT AT COOSA RIVER DEVELOPMENT.



Pennsylvania has been the leader in this country in the development of coal and iron and steel. It is producing nearly one-half of the iron made in the United States, and based on its coal and iron and steel Pennsylvania has become a land of marvelous industrial activity and wealth.

But Pennsylvania has no such advantages for the creation of industrial

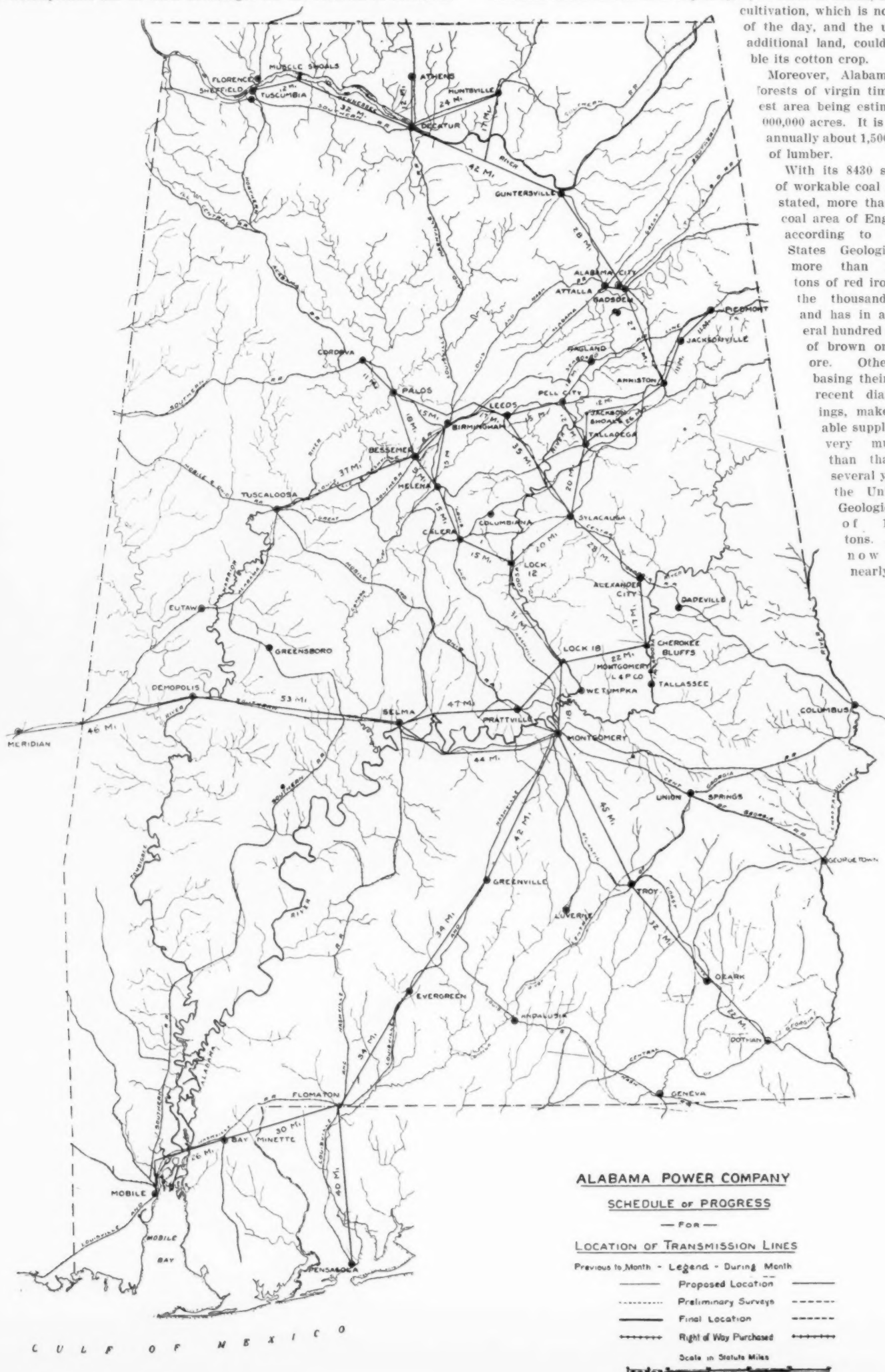
interests as has Alabama. Pennsylvania hauls nearly all of its iron ore from the Lake Superior region, 1000 to 1500 miles, to meet the coke. Much of Alabama's iron ore is in sight of its coal.

Pennsylvania has no cotton fields with their vast potentiality for agriculture and for manufactures.

Alabama raised in 1911-12 a crop of 1,700,000 bales of cotton, and by better cultivation, which is now the order of the day, and the utilization of additional land, could easily double its cotton crop.

Moreover, Alabama has vast forests of virgin timber, its forest area being estimated at 20,000,000 acres. It is now cutting annually about 1,500,000,000 feet of lumber.

With its 8430 square miles of workable coal fields, or, as stated, more than the entire coal area of England, it has according to the United States Geological Survey more than 1,000,000,000 tons of red iron ore above the thousand-foot level, and has in addition several hundred million tons of brown ore and gray ore. Other experts, basing their reports on recent diamond drillings, make the available supply of red ore very much larger than that put out several years ago by the United States Geological Survey of 1,000,000,000 tons. Alabama is now producing nearly 2,000,000



tons of pig iron as compared with a total production of the United States in 1880 of 3,835,000 tons. Its iron output nearly equals the total production of Pennsylvania in 1880, and its coal output nearly that of the bituminous coal output of Pennsylvania in that year.

The National Government has for some years been engaged in improving the navigation of the Warrior River so as to give ample depth all the year round for water-borne freight from the heart of the coal fields of the State to Mobile on the Gulf. No other State in the Union will have such advantages for putting coal by water transportation to the seaboard as will Alabama upon the completion of this work, upon which some millions of dollars have been expended. In anticipation of the early opening of the river for all the year traffic, large plans are under way for barging coal and other heavy products from the head of navigation to the Gulf, and thence to New Orleans and other ports.

It is anticipated that the opening of the Panama Canal, in connection with lessened cost of reaching the world's markets at a lower freight cost by river transportation, will so greatly stimulate coal, iron and steel development as to bring about a very rapid expansion in all the varied metallurgical interests of the whole State. This will stimulate every other industry and hasten the full development of the remarkable resources of the State.

The activity in the growth of the agricultural and industrial interests of Alabama is indicated in the fact that in 1900 the total value of the factory products of the State was \$80,000,000, while in 1912 it was \$180,000,000. In the same time the value of farming products rose from \$91,387,000 to \$184,186,000. During the same period the resources of the national banks of the State advanced from \$19,655,381 to \$72,769,368.

These facts justify a full story about the broad plans of the Alabama Power Co. and affiliated interests, whose coming into this State marks a new epoch in its history, for it brings into Alabama's development work some of the strongest financial forces in England.

The Alabama Traction, Light & Power Co. was formed in 1912 for the purpose of acquiring and operating electric-light plants, lighting and street railway systems in the State of Alabama, and has extensive rights under its charter to enable it to effect all the objects of its organization. It owns large riparian rights and water-power sites on the Coosa,

Tallapoosa, Tennessee and Little rivers, and Choccolocco, Town and Sautty creeks, capable of producing in all ordinary years a minimum of 500,000 horse-power.

A short time after its organization the company acquired a series of public utility enterprises in the northern part of Alabama by purchase from the Electric Bond & Share Co. of New York, a corporation closely allied with the General Electric Co. of New York, which had for some time owned and operated properties of that description in Talladega, Anniston, Attalla, Huntsville and Decatur, with a steam plant at each of the places named. It also acquired from the Electric Bond & Share Co. a water-power site on Little River, in the northeastern part of the State, capable of producing 2000 horse-power, and a site on Choccolocco Creek at Jackson Shoals, near Talladega, where a hydro-electric plant was in course of construction to develop 2000 horse-power. From this latter development, which has since been completed, transmission lines run to Talladega, Anniston and Gadsden. A hydro-electric plant of several hundred horse-power, which had been operating for some time at Attalla, near Gadsden, was acquired from the Electric Bond & Share Co. also, together with a lighting and power franchise in the three adjacent towns of Attalla, Alabama City and Gadsden.

The full list of properties taken over from the Electric Bond & Share Co. were as follows: At Anniston, electric light, street railway and gas plants and franchises; Huntsville, electric light and street railway; Decatur, electric light and gas; Talladega, electric light; Attalla, electric light and 350 horse-power hydro-electric plant; Little River, water-power site, 250 horse-power, with 8000 acres of forest land; Jackson Shoals, 2000 horse-power hydro-electric plant, partly completed; Gadsden, electric light and power franchise;

Town Creek, controlling interest in water-power site of 7000 horse-power potentiality; Sautty Creek, controlling interest in water-power site of 6000 horse-power potentiality. It also acquired transmission lines from Jackson Shoals to Talladega, Anniston and Gadsden. These lines are so constructed that they will obviate the necessity of other lines to serve that district from developments of much greater potentiality which are to be made later on.

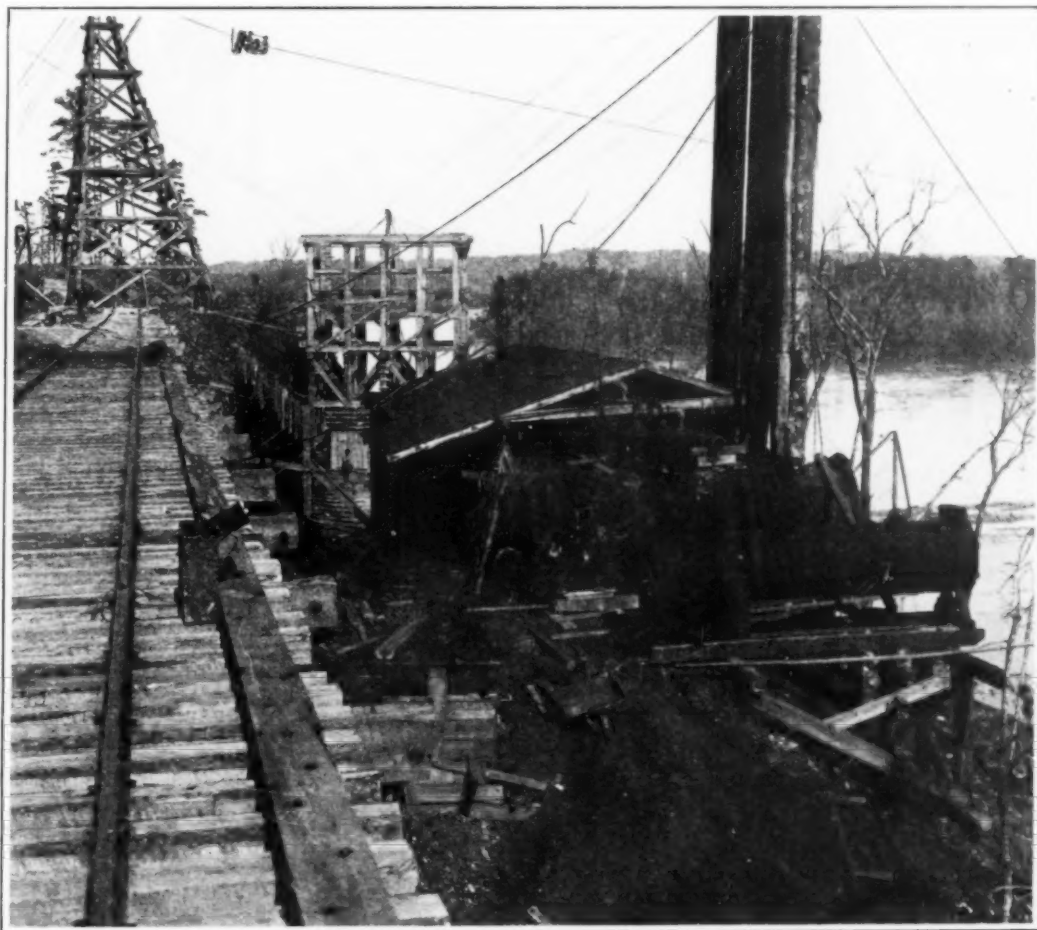
The Electric Bond & Share Co. had made arrangements to build a steam plant of 12,500 horse-power at Gadsden, and this work is now being carried on by the Alabama Power Co., a subsidiary concern to the Alabama Traction, Light & Power Co., and will be completed about July 1 of the present year. This plant will be held as an auxiliary to the hydro-electric developments to be made as a safeguard against accidents or deficiency in the river flow which might occur in exceptionally dry seasons.

The Alabama Traction, Light & Power Co. has two subsidiary companies, the Alabama Power Co. and the Alabama Interstate Power Co. It is the intention at present that the former of these shall build the hydro-electric developments on the Coosa River at Lock 12 and Lock 18, as well as the steam plant at Gadsden. The Alabama Interstate Power Co. will have charge of the developments at Cherokee Bluffs, on the Tallapoosa River, at Muscle Shoals, on the Tennessee, and in DeKalb county, on the Little River.

The only hydro-electric development now being made is that under the direction of the Alabama Power Co. on the Coosa River at Lock 12, in Chilton county. Lock 12 is 47 miles from Birmingham and the same distance from

Montgomery, and about 20 miles from Ocampo, a station on the Louisville & Nashville Railroad. From Ocampo there was a lumber road running to within four miles of Lock 12, and belonging to the Louisville & Nashville. This the power company leased and extended to Lock 12 for the purpose of hauling in the machinery, materials and supplies to be used in building the dam and putting in the power-house. The contract for the dam and power-house was let to McArthur Bros. & Co., one of the largest contracting firms in the United States, and work was begun October 1, 1912. It is to be completed November 1, 1913.

The dam will be 1500 feet long, 80 feet high and 72 feet thick at the base, and will contain 145,000 cubic yards of concrete. There will be 26 spillway gates 14 feet high and 30 feet wide. The dam will create a lake 25



PART OF THE CONSTRUCTION EQUIPMENT AT LOCK 12.

miles long, covering 6000 acres, and impounding 7,000,000,000 cubic feet of water. The river drains above the dam 9100 square miles.

The power-house will be 324 feet long and 142 feet wide, and will contain 45,000 cubic yards of concrete. The installation will consist of six vertical turbines of 17,500 horse-power each, the water-head on which will be 68 feet, with a total installation of 105,000 horse-power. The current will be generated at 6600 volts and stepped up to 110,000 for transmission. The length of the transmission lines will be 200 miles, and the supporting towers will number 1500.

There will be used in this construction work 190,000 barrels of cement, 71,000 cubic yards of sand, 179,000 cubic yards of stone, 2,300,000 brick, 3,700,000 pounds of structural steel, and 7,000,000 pounds of miscellaneous steel and iron. It will require 12,332 freight cars to transport the construction plant, materials and machinery necessary for the completion of the development.

If the power to be generated were used to light a highway with 50-watt incandescent lights 50 feet apart, the highway thus illuminated would extend around the world, with sufficient lap to reach from St. Augustine to Baltimore. The power thus generated will be equivalent to that generated for a year by the use of 595,000 tons of coal, and will to that extent prove of value in the general scheme of conservation of the natural resources of the country.

It is the intention of the Alabama Power Co. to make another development on the Coosa River at Lock 18, in Elmore county. At this point the total installed capacity is expected to equal that at Lock 12, 105,000 horse-power.

On the Tallapoosa River, at Cherokee Bluffs, also in Elmore county, the



Alabama Interstate Power Co. will make a development with a total installation of 132,000 horse-power capacity. It was the original intention to have this development come ahead of that at Lock 12, but it was finally decided to reverse the order and let Lock 12 come first, owing, among other things, to the fact that the company has a Federal charter of great importance covering the Lock 12 site, which charter would lapse if the work is not completed early in 1914. It had been supposed that the potentialities at Cherokee Bluffs were greater than those at Lock 12, but investigation shows that the total average throughout the year will be greater at Lock 12. This will come in part because of the development of hydraulic plants on the headwaters of the river in Georgia now being made by other interests, which will materially increase the average flow of the river at points below. Another governing factor in deciding the precedence of the developments is that the Lock 12 site is 40 miles nearer Birmingham and the great industrial section of Alabama than Cherokee Bluffs.

The Alabama Interstate Power Co. will also make the developments at Muscle Shoals, on the Tennessee River, in Colbert county, where there is an estimated potentiality of 400,000 horse-power, and on the Little River, in DeKalb county, where the estimate is 50,000 horse-power. These developments will be made when the demand for power seems to be close enough to justify them.

The company has already received a large number of applications for power from plants operating in the State, and many requests for information, as to amount of power available and its cost from electro-chemical and metallurgical companies, both domestic and foreign, and there can be no doubt that the completion of its developments will be the means of bringing to the State a great many manufacturing plants of a great many kinds. It is calculated that for the most part the power to be developed will be delivered to towns and cities in the counties of Limestone, Morgan, Madison, Marshall, Etowah, Calhoun, Talladega, Shelby, Jefferson, Walker, Tuscaloosa, Bibb, Lee, Chambers, Autauga, Elmore, Tallapoosa, Perry, Clay, Marengo, Dallas, Mont-

gomery. A survey of these counties shows that they are now using 442,000 horse-power in their various manufacturing enterprises. The class of plants using the largest amount are iron and steel mills, which use 218,250 horse-power. Coal mines come next with 56,598, followed by textile mills using 45,000, iron ore mines using 28,570, city lighting using 26,260, oil and fertilizer works using 12,160, railroad and car shops using 11,420. Other power-using plants embrace pipe-line foundries, gins and compresses, machine and metal-working shops, marble quarries, stone quarries, cement plants, brick plants, foundries and machine shops, saw and planing mills, general wood-working shops, pumping stations, flour and grist mills, ice plants, etc. The estimate for textile mills takes in the whole State, while the others are limited to the counties named. The public utilities properties taken over by the Alabama Traction, Light & Power Co. are all going concerns, and have been operated heretofore at a profit. With the economies capable of being inaugurated by the larger organization, it is expected that these properties will yield still larger net returns. As for the new developments being made and to be made there can be no doubt of their success both as profit makers for the company and as builders and developers of the industrial and commercial interests of the State and its various communities.

A promising phase of the outlook within the radius of the company's present activities and probable future developments is the cordial relations it has established with the people, whose friendship and co-operation it is desirous of securing and holding. The public and the press of Alabama have welcomed its coming, and those holding official position, from State authorities to municipal officers, have given the company all possible assistance and encouragement. It is realized that the developments to be made will redound to the general good of the State; that they will be the means of bringing into the State new men and new money, of establishing new enterprises, of opening up new lines of industry, of adding largely to the new prosperity that has

come to the Commonwealth and its people, and the limit to which no finite mind can calculate, no finite eye see.

The policy of the company is to treat the public frankly and with absolute openness, as parties in interest in the enterprise, because it is the public which, in the final analysis, will reap the greatest profit from it. This spirit of frankness and direct dealing is understood and appreciated by those who have been thrown in contact with the officials of the company, and is approved by them. As the editor of the Birmingham News wrote in the editorial columns of his paper, after a day's observation of the work at Lock 12, the careful studying of the company's plans:

"There is every ground for the conviction that this undertaking is under the direction of men here in this State who are profoundly conscious of their responsibility and of their opportunity to be of the greatest service to this Commonwealth. \* \* \* The enterprise bids fair to be controlled and directed by a policy of the most far-

seeing sagacity, of an enlightened selfishness, which realizes that the only way to build up a permanent institution of continuous profit to its owners is to determine how best it can serve the public so as to secure good will and co-operation."

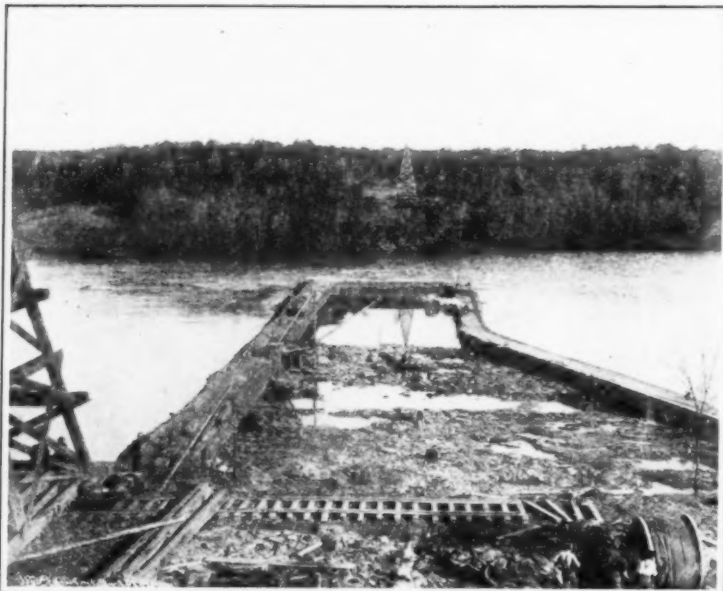
It is this enlightened action on the part of the company, met by the good will and co-operation of the people, that will make the great developments

now under way and in prospect most effective in the broad development of a great industrial State.

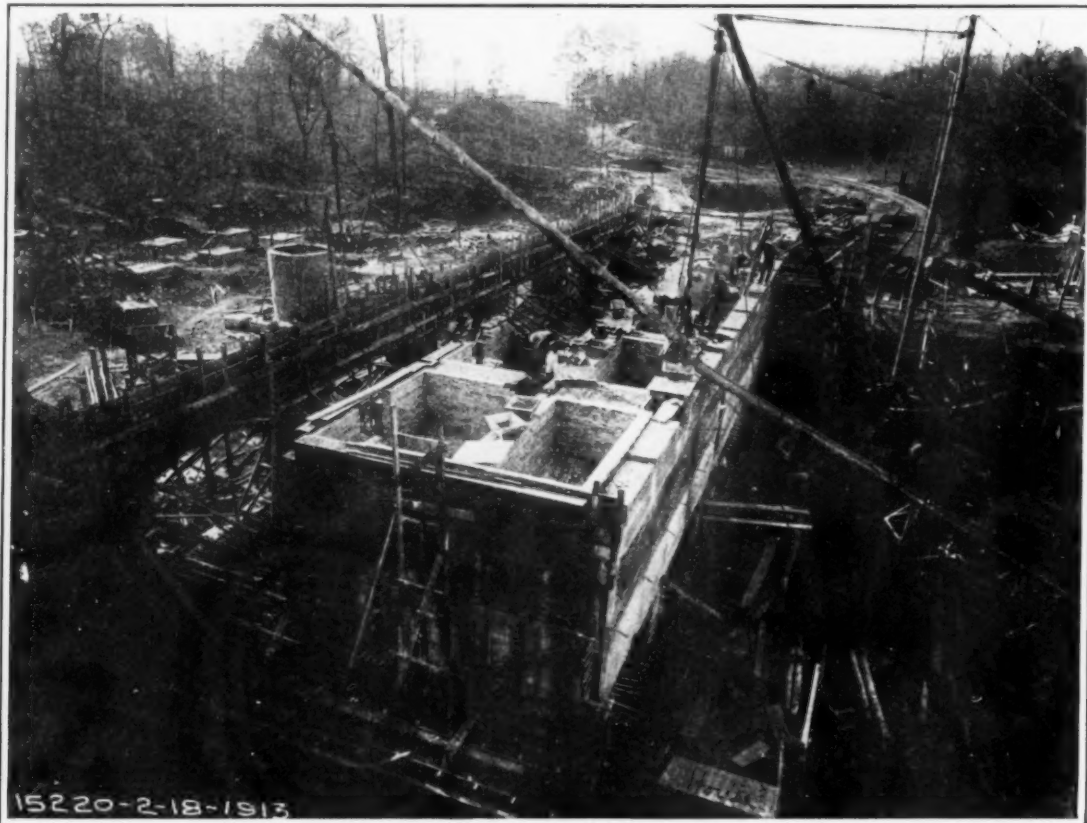
The conviction is general that Alabama will shortly become one of the most important coal, iron and heavy manufacturing districts of the whole world. Alabama already produces pig iron at a lower cost than it is made anywhere else in the world, and when the important industrial centers are brought into direct communication with the Gulf of Mexico by means of the waterways soon to be deepened and improved with that end in view, and when the opening of the Panama Canal shall give these centers cheap transportation to the growing markets of Western

South America and the Orient, Alabama will be in a most advantageous position with respect to competition, and will be able to make even more rapid strides than heretofore as an industrial and manufacturing State.

This is the end towards which the Alabama Traction, Light & Power Co. is building, and the coming of which it will do much to hasten. It is the end which the DeBardelebens, the Nobles, the Woodwards, the Kelleys, the Slosses, the Ensleys, the Shooks, the Belis and other vision-gifted men long ago foresaw, and which their activities did much to bring to the attention of others. It is the end toward which the sons of the Alabama of today, native and adopted, are striving with might and main.



THE COFFER DAM WHEN UNWATERED.



BRICK WORK FOR BOILERS, GADSDEN STEAM PLANT.

# Alabama Fuel and Iron Company

## A Record Extraordinary Even for a Region of Extraordinary Coal and Iron Development



A very interesting illustration of the richness of the South's undeveloped natural resources is furnished by the record made by this company.

After the coal lands of Alabama had been picked over for many years, Colonel Henry F. DeBardeleben, of whom it has been aptly said, "His success in enlisting foreign capital and his constant activity in opening coal and ore mines and in locating industries in the district cause him to be recognized as more nearly responsible for the Birmingham of today than any other man," looked into two of the culled sections which had been passed over by other prospectors and engineers, and after satisfying himself by exhaustive tests that both of these fields carried coal seams that could be profitably mined, busied himself in interesting the capital necessary for their development.

Organized during 1905 with an authorized capital of \$500,000 for the purpose of developing entirely new coal properties, the company shipped its first coal during the fall of 1906, and was just getting operations fairly well under way when the panic of 1907 so generally paralyzed the coal market that many mines not only went on partial time, but quite a few were forced to suspend operations.

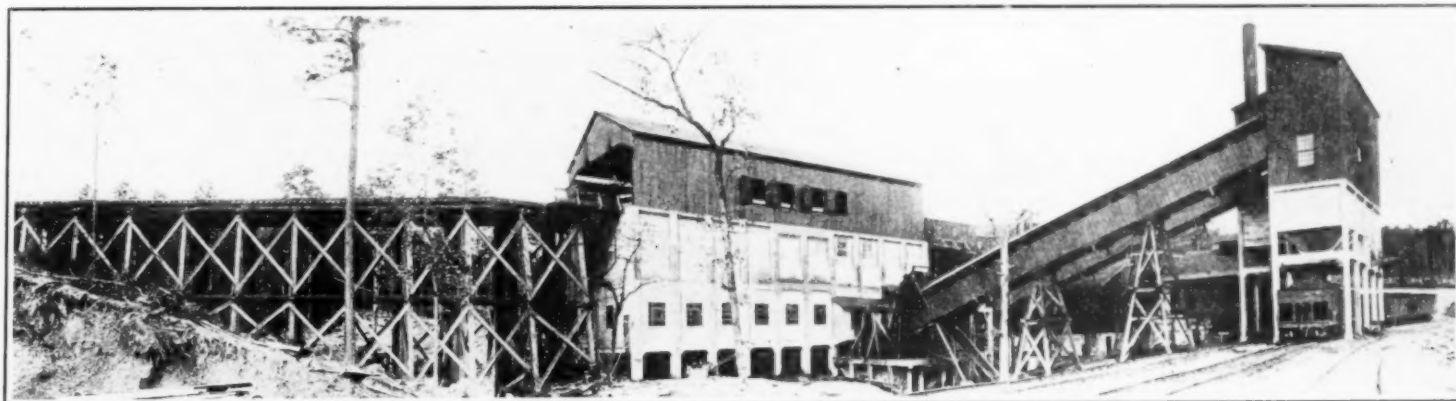
This period of depression extended over the years of 1908 and 1909 to such extent that coal mines generally showed a decided decrease in tonnage output, and the company that was able to hold its own was considered fortunate. The Alabama Fuel & Iron Co. was one of the companies that far more than held its own. Its history is told in the following figures.

coal from the settling tanks under the main washer building into the washed-coal loading bins, whence by gravity again it is dropped at a uniform rate into the railroad cars below and sent forward to market. The washer has a capacity of 3500 tons in ten hours, and by double shifting 8000 tons of clean washed coal can be turned out in twenty-four consecutive hours.

To take care of its wonderful expansion of trade and to provide funds for purchasing additional properties for future development, the company increased its capital during 1908 from \$500,000 to \$2,500,000, and during 1910 to \$3,500,000, and has, at opportune times, purchased either in fee simple or a control of coal and iron-ore lands, until it now owns or controls nearly 33,000 acres.

This company's Acton coal for general domestic use ranks second to none in the entire South; the larger sizes of coal from its Acmar mines are good for domestic purposes also, though not of such high quality as Acton. Its Margaret coal is used exclusively for steam purposes, and is so high in heating value that the entire output of these mines is sold far in advance, and a third slope is being sunk there now from which it is expected to still further increase the company's present large output.

Located at Colgate also is a central power plant where the company generates electricity for use at Colgate, Acmar and Margaret. All the ma-



COAL-WASHING PLANT OF ALABAMA FUEL & IRON CO. AT COLGATE.

The production of coal by years by the Alabama Fuel & Iron Co. has been as follows:

1906 .....	60,000 tons.
1907 .....	163,490 tons.
1908 .....	335,269 tons.
1909 .....	577,114 tons.
1910 .....	669,420 tons.
1911 .....	753,225 tons.
1912 .....	1,006,378 tons.

It is a record so remarkable that it will of necessity command the attention of every thinking person who reads it. As a matter of course, it was not achieved by haphazard business methods; on the contrary, it is due to a clearly-defined and steadfastly-adhered-to business policy, one of the most important rules of which is intelligent and thorough preparation of coal for market, followed by the sale of it along intelligent, conscientious and honest lines, so calculated as to give the customer permanent satisfaction.

This company was among the first to send to the commercial market coal thoroughly washed by the gravity process, and its success in the sale of well-prepared steam coal was such as to cause it to steadily increase its coal-washing facilities until, during 1911, it constructed at Colgate, Ala., a central point about equidistant from and between its Acmar and Margaret mines, and at which point there is an abundant water supply, the largest and most modern coal washer in the entire South.

A small view of this plant is shown herewith. The construction throughout is of concrete and steel. The main building is four stories high, and the railroad cars with unwashed coal from the mines pass through the fourth story.

The coal is first dumped into the steel and concrete hoppers on the fourth story of the plant and from there it is distributed by gravity to the jigs and settling tanks.

The handling of the coal through this washer is entirely by gravity until a complete separation is made between the pure coal and non-combustible matter, such as rock, slate, fire-clay, etc. The only hoist being one of elevator buckets and conveyor-belts, which lift the clean, washed

chinery at the washer is electrically-driven. All of the mines are lighted by electricity and all machinery inside the mines is electrically-driven.

An important feature in connection with the immense coal washers is that each unit of jigs or washing machines has its own individual motor which reasonably assures the uninterrupted operation by minimizing the possibility of a complete shut-down of the plant on account of jig troubles. One unit of the jigs can be cut out of commission without causing the slightest interference with operations of the others.

The construction of the plant is such that additional units of jigs may be added as the continued increase in the output of coal may require.

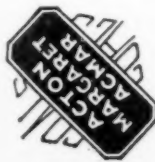
The company's Acton mines are located about 30 miles down the Cahaba basin from Acmar and Margaret, and at Acton it has another complete power plant where current is generated for the operation of those mines.

These coals are used over a range of territory extending from Boston, Mass., to Waco, Tex., and from Nashville, Tenn., to Tampa, Fla. The general office of the Alabama Fuel & Iron Co. is located in Birmingham, Ala.

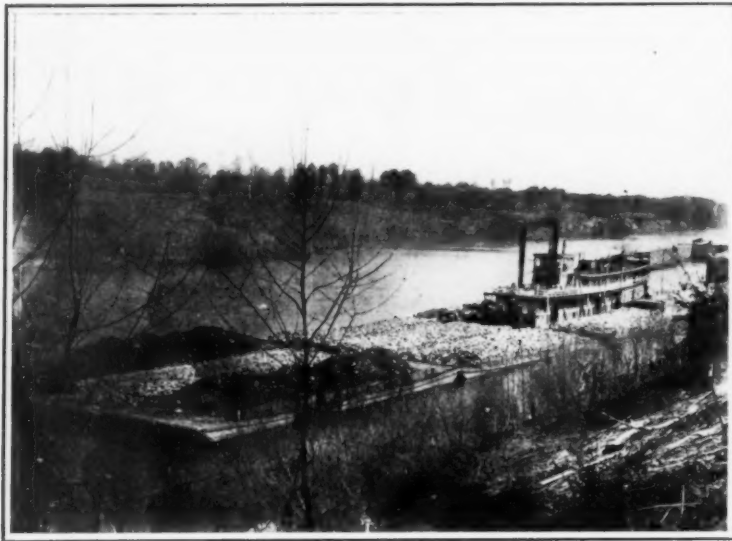
It is especially interesting that this splendid development should have come through the work of Henry F. DeBardeleben, one of the great pioneers of the Alabama coal and iron fields, whose keen insight into mineral resources and broad development work made possible very much of the wonderful advance of the whole Birmingham district.

It is also a matter of interest that before he passed away a few years ago he should have lived to see the fulfillment of his broad vision of Birmingham and of this company, the creation of his mature years and long experience in mineral development.

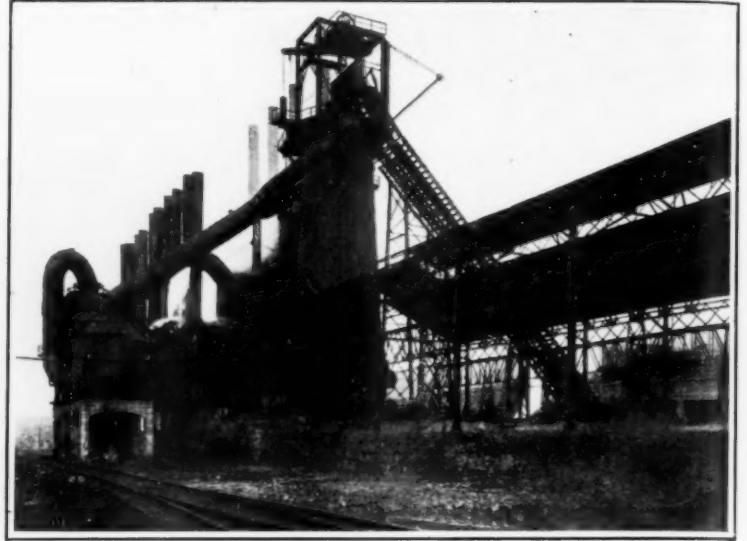
Beginning with an output of 60,000 tons of coal in 1906, the production has been rapidly increased, every year showing a gain over the preceding one, until in 1912 the company marketed over 1,000,000 tons, or over 5 per cent. of the total coal output of Alabama for that year. Considering the great number of coal mines in the State, the number of companies that have been extending their operations for fifteen or twenty years or more, and the coal operations of the big iron-producing companies for their coke, this is a remarkable showing.







LOCK 10, STEAMER NUGENT AND EIGHT BARGES.



FURNACE AT BOLT.

## "Try Tuscaloosa" For

Homes and Farms, Timber and Clays and Cement, Coal and Iron and Steel

**T**USCALOOSA COUNTY, situated at the very end of the Appalachian foothills in Western-Central Alabama, is larger in area than the sovereign State of Rhode Island, and more than one-fourth as large as the State of Connecticut. Within its borders the deposits of four great geological periods—the Silurian, Carboniferous, Cretaceous and Quaternary—blend to form sixty different soils, a greater variety than has been found by the United States Agricultural Survey in any other county of any State. With the relatively constant rainfall of the Gulf States, here averaging fifty inches per year, it is well watered. The annual mean temperature is 60 degrees—the summers being long, but seldom of great heat, the winters short and never rigorous. Livestock of all kinds live in the open throughout the year, and require the minimum of winter feeding or protection. There is the widest diversity in agricultural products and nothing approaching a crop failure has ever been known. Cotton flourishes—in 1911, an average year, there were grown 26,997 bales, and with it grow not only corn, wheat, oats, barley and rye, clovers and grasses, but also sugar-cane, peas, potatoes and all varieties of vegetables, fruits and berries. Small farms, intensively cultivated, already here splendidly illustrate Lanier's prophetic vision of a "New South." By truck and dairy farming on the largest scale, the Alabama-Bryce Hospital for the Insane has been enabled to maintain here for many years fifteen hundred inmates in comfort at a lower cost per capita than any similar public institution in the United States.

It is heavily and richly timbered, its forests yielding cedar, poplar, hickory, gum and cypress, besides all the varieties of oak and pine which grow in this latitude. Though sawmills have been at work along the railroad ever since they were built into the county, they are still working, and there are large areas of virgin timber yet standing. Along its southeast border begins the magnificent forest of the Kaul Lumber Co., embracing over 70,000 acres and carrying timber sufficient, as estimated to supply the large consumption of the giant mill recently built at Tuscaloosa and designed to cut 175,000 feet per day, for more than thirty years. West of the Warrior, in the northeastern portion, is another great forest of long-leaf pine, of which 23,000 acres have just been sold for immediate development for a price approximating \$700,000. Along the valley of the Sipsey in the west logging roads are now being extended both north and south, and it was here that one of three partners who had each paid in \$5000 six years ago upon a mill and timber

investment received from his associates a few days since \$65,000 for his interest.

All the materials for the making of cement are assembled in exhaustless quantities in juxtaposition with one another and with coal, and the strata of the Cretaceous period, crossing from east to west near the city of Tuscaloosa, contain the same clays that have made Trenton, New Jersey, famous for its brick and pottery. "In the abundant variety and good quality of its clays," says the State Geologist, "no county in Alabama can excel Tuscaloosa."

Nor is there any county of any State richer in coal. To quote the same authority: "While the two uppermost groups only of the Warrior basin lie near the surface in the northeastern half of the county, it must be remembered that the entire thickness of the measures, and consequently the whole series of the coal beds, which occur and are mined in other counties, lie below the surface in Tuscaloosa, at depths varying with locality; and there is no doubt that in the course of time all these coal beds will be mined by shaft or slope in this county. The supply of coal, therefore, which it holds below the surface, is practically unlimited. It must be remembered also that the entire series of coal beds of the Warrior basin outcrops in a narrow belt near the edge of the valley which forms the eastern boundary of the county, so that these lower seams, including the Pratt, Blue Creek and other celebrated veins, can be mined by slopes for a limited depth, beyond which, of course, resort must be had to shafts."

This judgment of Alabama's veteran State Geologist, who is president of the National Society of Geologists, has already received confirmation from drilling recently done. West of the Warrior, and farthest removed from the outcrops, repeated borings have demonstrated that thousands of acres are underlain at depths varying from 400 to 900 feet with beds of coal of finest quality from forty to eighty inches thick, lying almost in a horizontal plane and undisturbed by anything like a fault, making a proven field more valuable, in the judgment of experts, than any yet exploited in Alabama.

Beyond the upturned coal measures in the county's eastern valley is found limestone of the Carboniferous, Trenton and Dolomitic formations, suitable for fluxing; eastward of these, yet well within its boundary, occur great deposits of brown iron-ore, of which the relatively small portion worked near Goethite supplies the Birmingham district. Great in mineral wealth as this county is, its mineral development is only now beginning. The Warrior



U. S. POSTOFFICE.



ALSTON BUILDING.



COLONIAL HOME.



KELLERMAN COAL MINE, SIX-FOOT SEAM.



TOWBOAT CORNELIA C. AND BARGES OF TIMBER.

Southern reaches but the single great mine at Kellerman opened to supply the one iron furnace yet located within the county. But henceforward there is to be no such lack. In 1912 it was brought within the sphere of influence of the most aggressive and active agency in development work known to Alabama by the extension of the rails of the Louisville & Nashville system to the city of Tuscaloosa. The Gulf, Florida & Alabama, a new and supposedly independent line, is already under construction from Pensacola, planned to pass through Tuscaloosa into the same valley on its way to Jasper. Within the last year the Illinois Central, after most thorough surveys, made a final location with maximum grade not exceeding eight-tenths of one per cent. for its long projected line passing from its main stem in Mississippi through Tuscaloosa to Birmingham.

Within the same period a most advantageous location was secured for the line of the Gulf & Northwestern extending northward across the recently proven coal field along North River, for the development of which it is designed from Tuscaloosa, seventy-five miles, to a junction with the Illinois Central's line now ending at Haleyville, Ala. Engineers are now in the field revising the elaborate survey made some years back for the interurban electric line designed to connect Tuscaloosa with Bessemer, Ensley and Birmingham. Furthermore, and yet greater in its significance than any or even all of these proposed constructions taken together, the work of opening the Warrior River for all the year navigation by boats of six feet draught, is within this year to be brought to completion from the northeastern border of Tuscaloosa county to the head of the Mobile ship channel. Coming so nearly co-incident with the completion of the Panama Canal there is to be no delay in the utilization of this four-hundred-mile waterway—the shortest by many hundred miles that joins any coal field on this continent with the sea. There are to ply upon it within this year steel barges of modern design, already built and building, propelled by gas engines at a speed as great as nine miles per hour, and with capacity of not less than one thousand tons each, to supply cargoes for which mines are already being opened along the banks of the river in this country, and for the economical loading of which terminal facilities to cost \$70,000 are now under construction. This Tuscaloosa coal carried from mine to ship's side at less than fifty cents a ton must command the markets of all the Gulf Coast cities and fill the bunkers of all the great ships that are soon to crowd the waters of both

the Gulf of Mexico and the Caribbean Sea. Reaching New Orleans through Mississippi Sound and the Lake Borgne Canal, it must immediately complete the displacement of Pittsburgh coal already begun there. A very great development of Tuscaloosa coal mines must inevitably result. The advantages of short and direct all-water transportation will be hardly less for iron and steel manufactures than for coal. The prediction of the pioneer iron-

masters and of Alabama's greatest statesman, the far-seeing, broad-minded John T. Morgan, must then surely find early fulfillment in

the lining of the banks of the Warrior River at and near

Tuscaloosa with the greater iron furnaces and the

more gigantic steel mills of the future, whose

products are to dominate the markets of the

world. And thus the city of Tuscaloosa, small as it yet remains, though now

rapidly advancing, uplifted not only

by the quick development of the

long latent wealth of Tuscaloosa

county, but also by a yet greater

expansion of that of the whole

mineral district of Alabama

at the natural outlet of

which it is placed, with the

proven gas field and poten-

tial oil-sands of Fayette

but thirty-five miles to

the north, and the inex-

haustible marble beds

of the Cahaba hardly

so far to the south-

east; with the richest

agricultural lands

of Alabama's Black

Belt and Canebroke

coming up to its very

borders on the south

and southwest; with

a site seemingly designed

by nature for a great city

of manufactures and com-

merce, its noble plain lying

high above its river at the

base of the last foot-hills of the

many-treasured and far-stretched

Appalachian mountain range, must

now at last fulfill what the pioneer

settlers, the government surveyors and

the early legislators of Alabama must all

have believed to be its manifest destiny, when

they laid out its broad streets and avenues and

brought to it, first the political capital, and then the

educational center of the most richly endowed of the great

States of the South.

It matters not that,

under the conditions

of slavery, Montgomery

took away the State

Capitol; that, in the decades since slavery passed, obscure Elyton has be-

come magic Birmingham. Tuscaloosa, in the pioneer days fairer and

stronger, is again to be greater than both. Birmingham has coal and

iron, but no river; Montgomery has a great river and a fertile soil, but

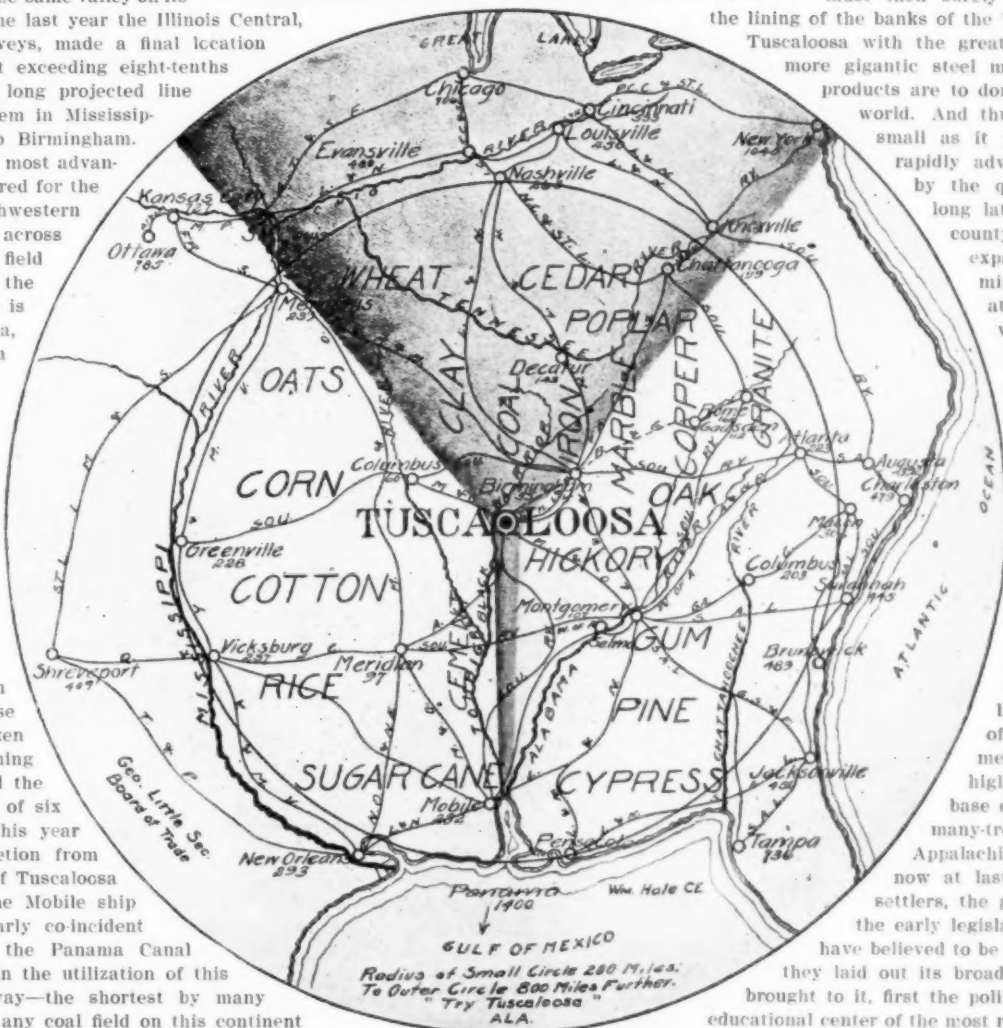
neither coal nor iron. Tuscaloosa has all, and more than all, that have

made the growth and wealth of both. For Tuscaloosa, at the last, "this

better thing has been reserved"—to be the Pittsburgh and the St. Louis

of the South in one.

### TUSCALOOSA TOWS TO TIDEWATER



"This remarkable drawing shows at a glance the unlimited resources of the Tuscaloosa district and the feasibility of their exportation down the Warrior and Tombigbee rivers to the Gulf of Mexico, as through a funnel. Tuscaloosa is the center of a double circle. The scale of miles in the inner circle is based on a radius of 200 miles, while the outer circle is 400 miles further. This was done in order to show distances to all the important cities of the United States."





HARBOR SCENE IN TAMPA.

# Tampa: A Thirty Million Dollar Port

## Metropolis of Florida's Gulf Coast

Tampa is the nearest and most available port of any importance in the United States to the Panama Canal.

—From Resolution adopted by Congress in 1906.



OST persons are so accustomed to think of Florida as a place merely of sunny skies and green and golden groves, of acres of strawberries showing green and scarlet in the balmy air, of glistening lakes and alluring woodland scenes—so used to regarding the entire State as a vast pleasure-ground for those who have the means to enable them to indulge their fancies, that they lose sight of the wonderful strides it has made and is making in commerce and manufactures and all those other things of a material nature that go to make up the strength and greatness of a Commonwealth. As illustrating what Florida is doing along these lines, the progress of one of its most important cities may be cited. Tampa, scarcely more than a village a decade and a half ago, but now the second city in the State in size and the undisputed metropolis of the Florida Gulf Coast—Tampa advanced during the past year to the proud position of a "thirty million dollar" port; that is, the water-borne traffic passing through the port of Tampa during the year 1912 reached in value the great total of \$30,104,414. This was an advance of more than \$7,000,000 in value, while the increase in cargo was more than 200,000 tons. At all ports there are fluctuations from year to year in specific items of export, and this great increase in commerce was made despite a falling off in the shipments of phosphate and naval stores, brought about by causes temporary in their nature. As the center of the great phosphate-rock shipping interests of the State, Tampa, of course, will increase its phosphate handling business with the continued growth of this industry. The lumber and naval stores business, too, will no doubt show an increase in the future, for the reason that the country to the north is rapidly becoming deforested and the supplies of both must be largely drawn from territory tributary to Tampa, which still has 50,000,000,000 feet of standing timber.

The reason for the increase is twofold. In the first place, there has been a steady growth in production throughout the country tributary to Tampa, and a steady growth in population; the one accounts to a certain degree for the increase in exports, the other for the increase in imports. These two, however, would not have caused so great an increase had it not been for the constantly-increasing facilities for handling the business which have marked the progress of the port of Tampa. These facilities are of the most modern character, the phosphate elevators especially being of the latest design and the largest size. So perfect are the arrangements that a ship can take on a cargo of 4000 tons in twenty-four hours. Arriving early one morning, with her cargo lying ready to hand, she can take it on and steam from port at daylight the next. Few ports on the Gulf Coast can load a vessel in the same length of time with the same amount of cargo; none can do it in any less.

The character of the business handled through the port of Tampa is an index of the general business of the city, and is given here, expressed in tons: Phosphate rock, 963,440; miscellaneous, 269,034; fuel oil, 179,327; coal, 147,415; refined oil, 44,667; pine lumber, 61,675; shell, 40,102; cement, 25,022; sand, 28,343; cypress lumber, 19,140; fruit, 8434; ice, 6941; water, 6125; bricks, 5500; cedar logs, 5550; gravel, 5500; trap rock, 4000; salt, 2965; fertilizer, 2520; tile, 1688; fish, 1685; iron piping, 1460; asphalt blocks, 1099; mixed oil, 3798; cedar boards, 500; wood, 480; cotton dross, 375; shingles, 347; plaster, 300; lime, 200; oysters, 149; rosin, 140; orange crates, 45; hides, 10; coffee, 10; mahogany logs, 25. Total weight handled, 1,838,011 tons.

Of the total value of commerce handled through the port of Tampa, \$17,458,475 was import and \$12,645,939 was export.

Of the vessels carrying this commerce, the steamers were American, 479; British, 120; German, 28; Spanish, 25; Italian, 20; Austrian, 13; Norwegian, 9; French, 5; Swedish, 5; Danish, 3; Dutch, 2; Uruguayan, 1; Mexican, 1. Other vessels were American, 282; British, 15; Honduran, 3; Norwegian, 2. The net tonnage of these vessels was 1,333,975 tons, and they sailed under fourteen flags.

As the figures show, phosphate forms the largest item of Tampa's tonnage, being slightly more than that of all others combined. Tampa, as is well known, is backed up by a country in which are immense deposits of phosphate, of both the hard rock and pebble varieties. This is the center of the phosphate mining industry of the world. With the constant expansion in the consumption of fertilizers in this country and abroad, the phosphate-rock industry will rapidly increase for years to come. The bulk of the phosphate shipped through the port of Tampa is pebble, and of this by far the larger part handled goes to foreign countries. The exports in 1912 by countries was as follows:

Country.	Tons.	Country.	Tons.
Belgium . . . . .	127,372	Spain . . . . .	42,690
France . . . . .	108,665	Sweden . . . . .	20,250
England . . . . .	77,780	Denmark . . . . .	16,400
Italy . . . . .	69,345	Ireland . . . . .	15,000
Germany . . . . .	60,785	Scotland . . . . .	14,750
Holland . . . . .	58,380	Netherlands . . . . .	6,600
Japan . . . . .	51,700	Canada . . . . .	2,100

Next to phosphate in tonnage and beyond it in value is the oil business done through the port of Tampa. During 1912 the amount of oil handled approximated 70,000,000 gallons, valued at about \$5,000,000. Of this, 54,000,000 gallons was fuel oil, the remainder refined. All the oil received in Tampa comes from Port Arthur, Tex., and Tampico, Mexico. It is brought in vessels that carry all the way from 25,000 gallons to more than 1,000,000 gallons. From Tampa it is distributed to Gulf and local points in many different ways, a large part of that to other ports being carried in the oil-tank steamer, Captain Collier, said to be the smallest tank ship in the world. This boat makes an average of a trip a week, supplying all points from Cedar Keys to Miami. The demand for the tremendous amount of fuel oil received in Tampa comes from the big plants at the phosphate mines and elsewhere, many of which have discarded other fuel in favor of oil. The oil is carried to these plants in the interior in solid trains of tank cars, frequently more than a train a day leaving the oil docks for the various interior points.

The history of Tampa's growth as a port is an interesting one. Little was thought of its possibilities along that line, it seems, up to a quarter of a century ago, and in 1885 its customs receipts were but \$683.08. The next year they increased to \$2508.70, whereupon a newspaper of the day came out with these headlines:

"Tremendous Increase in Revenue—276 per cent. Increase in Collections at This Port—Last Year the Total Was Only \$683.08: This Year the Tremendous Total of \$2508.70—Watch Us Grow."

This statement voices the spirit which has made Tampa what it is, and which will make it one of the great cities of the country.

Tampa did grow, and the port grew until in 1912 its receipts had increased to \$2,009,038.36, or a fraction more than 800 times what they were when those headlines exulted over an increase of 276 per cent. and the "tremendous total of \$2508.70."

Once awake to the possibilities of their position, the people of Tampa began going before Congress, and have been going before it ever since, demanding and securing appropriations for the improvement of their port. Foot by foot the channel leading up to Tampa has been deepened, and each time one appropriation was exhausted the necessity for another had been made so apparent by the increase in traffic that it was forthcoming, and the machinery was set in motion for the greater depth. Twenty years ago the channel was but eight feet deep and of uncertain width; by 1908 it had been made twenty feet; in 1912 it had grown to twenty-four, and as this is written the rivers and harbors bill pending before Congress bears provision for an appropriation to make a channel thirty feet deep from the bar to the head of the Tampa Harbor. With the deepening has gone along the widening of the channel, until by the time the thirty-foot appropriation is expended it will be ample in every way for the largest and heaviest draft steamships to enter and discharge and take on cargo at the docks within the limits of the city.

To meet the demands of this growing commerce docks and wharves and warehouses have been built, and others are going up as the business continues to expand. The city, mindful of the policy of the Government to improve the waterways to those cities only that are in position to keep their terminals from falling into the hands of monopolies, has secured sufficient water front to

Tampa has twenty-three wholesale grocery houses and other wholesale concerns that deal in building materials, dry goods, drugs, wagons, harness, farming implements, hardware, marine supplies and numerous other articles of every-day use. There are openings for many more wholesale establishments dealing in a variety of things not specified above, such as hats, shoes, etc.

In municipal matters Tampa is making great progress. The people have but recently voted for a bond issue of \$1,700,000 for a sewage system, a city building and some fifty miles more of paved streets. A large bridge across the Hillsborough River, connecting the two parts of the city and rendered necessary by the growing traffic, is now being built, and will soon be completed. It is a "lift" bridge, and one of the largest of that type ever constructed. The city has already some forty miles of paved streets, thirty miles of them brick and ten stone. With the addition of the fifty miles provided for in the bonds just voted, it will be one of the best-paved cities of its size in the country. It now has 37.93 miles of sewers, and with the new sewage system soon to be installed will rank high in the matter of sanitation.

There are three National and five State banks in the city, with combined capital of \$1,200,000 and deposits of \$9,000,000. These banks recently showed their own strength and their confidence in the city by purchasing \$615,000 worth of municipal bonds. The assessed value of real estate in Tampa is \$26,547,718, the assessment being on a 50 per cent. basis.

Tampa has a fine public school system, handsome church edifices representing all the leading denominations, many beautiful homes and thousands of the most generous, hospitable, kindly people on earth. It has a delightful summer and winter climate, an ample supply of good, pure water, is healthful at all times and a pleasant place of residence at all seasons.



TAMPA IN 1912.

Tampa in 1912 attained the distinction of a \$30,000,000 port. In years to come it will more than maintain its increase, and between \$40,000,000 and \$50,000,000 is not an impossibility for 1913. Before the year is ended the Government will have completed the work on the estuary, shown above as Ybor Channel, beginning at the bay at Hookers Point to a point within a short distance of head of 15th street, a distance of about 2½ miles—24 feet deep and 500 feet wide. The improvement also includes 24 feet from Hendry & Knight channel to Sparkman Bay, or turning basin. Terminal facilities are being planned. One \$1,000,000 company has already been formed to build warehouses and coal elevators. The city owns 700 feet of dockage on either side of the channel, near the upper end, and will improve same. The city also controls the entire estuary project 700 feet back from the center of channel on either side, guaranteeing equal charges to all shipping. Municipal controlled dockage, a land-locked harbor quiet as a mill-pond inside, splendid rail connections, modern terminal equipment, 5 additional miles of dockage, spell great things for Tampa as a seaport. For the past year Tampa's dockage facilities have been inadequate for shipping offered it, but Tampa is now preparing to provide facilities to care for its rapidly expanding commerce.

assure fair treatment to shippers and transportation lines, and will provide municipal docks as the necessity arises.

In the matter of railway lines, Tampa is well provided for, having the Atlantic Coast Line, the Seaboard Air Line and the Tampa Northern, which, with their connections, give the city and surrounding country good service as regards both passenger and freight traffic. These railway lines all have terminals embracing docks and wharves, and freight, either coming or going by water, can be easily transferred from car to ship or ship to car.

Nor is it in her water-borne commerce alone that Tampa shows a rapid and steady growth. In every other line that indicates a developing prosperity the city has made, is making, progress. In the matter of postoffice receipts, the growth in 1912 over 1911 was 8 per cent., or \$14,015.78, the total being \$174,010.94 in 1911 and \$188,026.72 in 1912. The clearing-house transactions showed an increase of nearly 5 per cent. in the same time, and the value of buildings erected during 1912 totaled \$385,795. An eight-story hotel was completed and two ten-story business buildings almost completed during the year. The number of cigars made in the city increased also, the total for the year being approximately 300,000,000, or about 1,000,000 for each working day.

In addition to its cigar factories, Tampa has many other industries, including foundries and machine shops, broom factory, brush factory, sail and awning works, mills and woodworking plants, steam ways, etc. It is estimated that of the 54,000 people living in the city and its immediate suburbs, 30,000 get their living from the various manufacturing plants, the weekly payrolls of which total \$250,000.

The country tributary to Tampa is the garden spot of Florida. It is the choice citrus fruit land, the best trucking land and the best general purpose land in the entire State. While no part of Florida is below the frost line, Hillsborough county, of which Tampa is the county-seat, and those counties immediately adjoining it are rarely visited by frosts that kill, and groves of citrus trees thirty, forty and even sixty years of age are standing there to witness the fact that the Tampa country escaped the worst of the "big freeze" of 1895. The hundreds of groves and thousands of acres of trucking and farming lands under cultivation throughout that section are sending out hundreds of thousands of packages of fruit and vegetables to Northern markets each season, for which hundreds of thousands of dollars are brought back to swell bank deposits, pay rents and labor accounts and keep up a steady flow in the arteries of general trade and commerce.

With the completion of the Panama Canal and the easy access to the Orient it will give ships sailing from Southern waters, the port of Tampa will profit as no other Southern port can. Congress said in a resolution adopted in 1906:

"Tampa is the nearest and most available port of any importance in the United States to the Panama Canal."

The completion of that greatest piece of constructive engineering ever carried on by any government will open vast opportunities to Tampa, and Tampa is preparing grandly to grasp and wield them for the upbuilding of a great port and a great city.

A live commercial organization, the Board of Trade, will send a beautiful book to anyone upon request.



# JACKSONVILLE A GREAT SEAPORT

Logical Location of Great Manufacturing Industries—Municipally Owned Docks and Terminals On Deep Channel—Low Port Charges—Cheap Fuel

THE GATE THROUGH WHICH MUST PASS THE PRODUCTS OF THE WEST INDIES,  
CENTRAL AND SOUTH AMERICA AND THE ORIENT, TO A VAST TERRITORY  
A UNIQUE STORY OF PROGRESSIVENESS



he Jacksonville Board of Trade probably belongs the unique and distinctive honor of having accomplished something which no other commercial organization in the United States has ever accomplished, namely, the calling together, at its expense, of a special session of the Legislature of the State. About 18 months ago the Jacksonville Board of Trade came to a realization of the fact that its docking and terminal facilities were totally inadequate even to take care of the business at present carried on on the St. John's River and at the port of Jacksonville. For 25 years the Board of Trade has been instrumental in the securing of deep water in the St. John's from the city to the sea. At the time the Board took this matter up there was a channel of only 11 feet from the city to the ocean. In order to show that it had faith in the future, the Board advocated the county's voting \$300,000 bonds to make the first improvement. The bonds carried by quite a large majority.

A little over two years ago the 24-foot channel was completed, at an expense to the National Government of about \$3,000,000. It was only a short time before the Board realized that, in order to take care of the increasing business, it was necessary to have proper docking and terminal facilities.

Eighteen months ago it was found that there were only three docks in or near the city that could accommodate foreign vessels at one time, and that these were owned by private individuals and corporations. Steamers from Europe, loaded with German potash, iron pyrites and general merchandise, were coming to this port, and had to unload their cargoes at various railroad terminal docks and at the docks of the fertilizer companies. Every time these vessels were moved it was an expense to the shipping interests. The Board of Trade, therefore, determined to rectify this matter, and appointed a committee which was known as the Improved Terminal Facilities Committee. This committee held upward of sixty meetings last year, and made a very thorough investigation of the municipal ownership of docks and terminals at all ports in this country, and also made a study of ports in Europe. The results secured from the municipal ownership of docks at Los Angeles, Baltimore, New York and San Francisco were so satisfactory that the committee determined that Jacksonville must own its own docks and terminals; but in order to do this, it was found necessary to have a special act of the Legislature passed, as under the present city charter it could not own, operate or control such docks and terminals. The Board of Trade, therefore, requested the Governor of the State to call a special session of the Legislature at its expense. The request was complied with, and on October 1st, 2d and 3d the legislators met in the city of Tallahassee and passed two acts, one an enabling act, authorizing the city to own, operate and control municipal docks, and submitting to the electors of the city the matter of a \$1,500,000 bond issue to carry out the purposes of the act. The other bill granted to the city the right to use the middle ground in the St. John's River near the city for the purpose of a dock site, comprising over 200 acres, with four miles of frontage on the channel.

Immediately a Dock Campaign Committee was appointed, composed of not only Board of Trade members, but other prominent citizens of the city, and for six weeks they waged a campaign of education of the voters, showing them the necessity for these docks. During this campaign upward of 50,000 pieces of advertising matter and literature were issued from the Board of Trade Campaign Committee's office. Slides were put on at all the moving-picture theaters, showing the docks at this and the various ports of other countries. Ten thousand campaign buttons were issued, and many a man in this city that never wore a campaign button before in his life was proud to wear this Dock button.

During the five or six weeks of the campaign over 4000 inches of reading story matter regarding docks in other cities and what has been accomplished by them was featured in the daily papers of the city.

A few days previous to the date of the election, which was Tuesday, January 21st, a whirlwind campaign was made in the nine wards by a parade of automobile enthusiasts, 50 automobiles being in line, headed by the First Regiment Band in a motor car.

The bill provided for a Board of Port Commissioners numbering 15, to be elected at the same time as the voters passed upon the bond issue. In order to show the interest aroused in this campaign, no less than 53 candidates announced for the offices of Port Commissioner. Tuesday morning, January 21st, dawned a beautiful day. The ward committees were in the polling places. A Central Campaign Committee was at the Board of Trade Building, in close touch by telephone with every polling place. Several hundred automobiles were placed at the disposal of the Campaign Committee, and these carried the voters from the various shops and warehouses and office buildings to the polls. Every hour each polling place made a tabulated report of the number of votes cast to the central office. One of the greatest difficulties that had to be overcome was the fact that the act provided that, in order to make it a legal vote, 40 per cent. of the qualified voters must have participated in the election. When the polls closed at 5 P. M. that day it was found that 53½ per cent. had voted.

During the early morning hours of the following day, Wednesday, it was found that over 99 per cent. of the ballots were cast for bonds, and a splendid Board of Port Commissioners had been elected, every one being a solid business man of Jacksonville. Only 42 citizens of the city voted against the issue of bonds. It is believed that such a result is unprecedented in any important bond election ever held in this country.

The great results which will come to Jacksonville from this election and the securing of municipal docks and terminals cannot be estimated. With the completion of the 30-foot channel from the city to the sea by January, 1915, and the completion of the municipal docks and terminals and the opening of the Panama Canal at the same time, a large volume of new business will open up for this port from Central and South America and the Orient. Jacksonville is destined to be the greatest port on the South Atlantic coast, with a vast territory reaching through the States of Georgia, Alabama, the Carolinas, Tennessee, Kentucky and Ohio.

If a plumb line of sufficient length could be hung on the lighthouse tower at the mouth of the St. John's River, reaching to the Isthmus of Panama, the entrance of the Panama Canal would still be a little over 50 miles to the east of the plumb bob. Few people realize how directly south of Jacksonville the entrance to the Panama Canal is, or that the west coast of South America lies to the east of the east coast of Florida. The canal will open up to the port of Jacksonville innumerable new markets of that coast, and the increasing depth of the St. John's River channel, together with adequate municipally-owned docks and terminals equipped with the most modern loading and unloading devices, together with reasonable and low port charges, insure the flow to this city of immense volumes of trade from the West Indies, Central and South American ports, to say nothing of business with the Pacific coast of the United States and the Orient. Jacksonville's proximity to the coal and iron fields and cotton mills of the South will make it an ideal trading port. The Board of Trade has appointed a special committee on foreign and domestic commerce, which is gathering data of the resources of the State and the South for the purpose of showing the countries of Central and South America what we have to dispose of in exchange for their products, such as hides, coffee, minerals, hardwoods, etc. This committee will get in touch with United States consular agents at all of these foreign ports, and acquaint them with the facilities we have for doing business. It is not improbable that a representative of the Board will a little later make a tour of those countries to get in personal touch with the exporters and manufacturers of these Southern countries.

With its splendid transportation facilities by rail and water, Jacksonville is an ideal location for manufacturing industries of all kinds. The city owns its own water-works and electric-light plant, and has just completed a half-million-dollar power-house, from which it is able to dispose of electric current for power purposes at the low rate of two and a half cents per kilowatt per hour. All of the large oil companies have immense storage tanks on the river front, and, with the coal fields of Alabama close at hand and low rates on coal by water from the Eastern fields, the cost of manufacture should be as cheap here as anywhere in the country. Many manufacturers in the Middle West have their eyes on Jacksonville, as they are commencing to realize that they must move to a South Atlantic port in order to get their share of the business which is bound to open up by reason of the Panama Canal construction.

The rates by water from Jacksonville to San Francisco via Panama will necessarily be lower than can be obtained from the transcontinental railroads. With cheap power, cheap labor, low freight rates, on account of water competition, low port charges on account of municipal ownership of docks and terminals, Jacksonville is now able to solve the many vexing problems facing the manufacturers of the country. Jacksonville, the metropolis of the State which is today producing over 50 per cent. of the country's consumption of rosin and turpentine, and over 60 per cent. of the phosphate rock consumed, over 40 per cent. of fuller's earth, with vast deposits of kaolin clay for making the finest of china, with extensive forests of long-leaf yellow pine, hickory, oak and gum, is the place of opportunity for manufacturers with raw material at the door. The Jacksonville Board of Trade, really the power-house of the city, with a membership composed of over 1900 of the liveliest business men of the community, housed in its own building, which with the lot is worth a quarter of a million dollars, stands ready to furnish all inquirers with full information concerning the opportunities and possibilities of investment, wholesale and retail business and manufacturing openings, with pamphlets descriptive of climate, health, educational facilities and business statistics, and is ready to extend a typical Southern welcome to new settlers and homeseekers. The spirit of Jacksonville, as shown in its splendid office buildings, its many crowded hotels, its life and activity, is most admirably typified in the Board of Trade's work in having a special legislative session called at its expense and for no other purpose than to pass two bills giving it the privilege of spending \$1,500,000 for municipally-owned docks. That fact alone tells the whole story.

# The Paint-Oil Business of the World Facing a Revolution



AN enterprise was organized and set going in Jacksonville a few months ago which has for its object nothing less ambitious than to revolutionize the paint-oil business of the entire world. This it proposes to do through the medium of two products intended to supersede linseed oil and turpentine, manufactured at a cost so low and with so many other advantages over its rival products that they will find competition impossible.

These two articles are called "Linsoil" and "Taylorine," respectively, the former intended to take the place of linseed oil in mixing paint, and the latter that of turpentine as a dryer. They are made by combining petroleum and other natural products by means of heat and distillation, and both are the product of the combination, each being taken off at a different stage.

These products and the means of their manufacture are the result of many years' work and investigation by J. E. Taylor of Jacksonville, whose inventions and processes have been taken over by the Southern States Refining Co., Jacksonville, Fla., a corporation in which Mr. Taylor is a large stockholder, director and general manager. Mr. Taylor's son, Clifford E. Taylor, long associated with his father in perfecting his inventions, is now employed by the company as superintendent of its manufacturing plant.

Petroleum as it comes from the refinery has been the despair of painters and paint grinders because of its non-drying qualities, which render it useless for paint purposes. Mr. Taylor years ago became possessed with the idea that some system of combination could be worked out whereby petroleum could be utilized as the basis of a paint oil, and with the persistence of the true inventor he set himself to the task of working out the process. It took many years of exhaustive labor and experiment, with disappointments and setbacks innumerable, but the reward of persistence came at length, when he was able to announce to the world that he had worked out the problem and was ready to offer the trade an oil and a dryer to take the place of those heretofore exclusively used. This announcement was not made until the product of his labors had been given practical test over time enough to prove its worth.

This was done by using the oil and dryer in all classes of painting and finishing work—hotels, office buildings, business blocks, residences, automobiles, carriages, boats, hot smokestacks, roofs and general inside and outside finish. Every kind and character of painting that would serve to prove the quality of the new products was welcomed by Mr. Taylor as demonstrating what they would do. In every one of these tests the virtue of Mr. Taylor's inventions was fully demonstrated, the test being made over a period of several years, and the work showing wearing qualities as good or better than that done with linseed oil and turpentine.

Thoroughly convinced that he had brought his discoveries and inventions to a basis that made them commercially practical, Mr. Taylor a few months ago decided to organize a company with sufficient capital to establish a plant for the manufacture of the products, and to put them on the market in large quantities. As a result of this decision, the Southern States Refining Co. was organized in April, 1912, to take over the Taylor processes and manufacture the products.

The company was capitalized at \$250,000, and the stock offered for sale was practically all taken by Jacksonville people, among them being a number of the leading business men and capitalists of the city. A tract of land 510x219 feet in area was procured in the western part of the city, and there the necessary buildings, tanks, furnaces, stills, retorts and machinery have been erected and installed to turn out 150 barrels of the products daily, with ample space to largely multiply the output when the demand for it shall have been created.

The oil, known as "Linsoil," is made by charging a big retort with petroleum and the other essential ingredients and subjecting the mixture to the proper degree of temperature, which brings into chemical combination the various properties, creating an oil that has the proper drying qualities. This oil comes from the retort of a dark color, as dirty looking as crude petroleum. It is then put through a number of processes, from which it emerges with a clear, almost amber degree of yellowness. As finished by these various processes it is free from impurities of all kinds, and will stand for days without depositing any perceptible amount of sediment upon the bottom of the vessel in which it is contained. One feature of the refining process for which much virtue is claimed is that it is refined in such a manner as to meet the atmospheric conditions to which it will become subject when mixed with the pigments and spread upon the wood or metal or other substance, the surface of which it is intended to cover.

From the tanks of its final refinement the oil goes into barrels, and is then ready for use, carrying 100 per cent. of paint stock and absolutely free of coloring matter of every character.

Applied to white lead, the "Linsoil" thins and mixes it just as does linseed oil, with the difference that it carries to the white none of that yellow look that linseed oil gives it. The "physical measurements" are about the same as those of linseed oil, and paint mixed with it in the same manner as with linseed oil will be found to spread equally as well.

Some of the advantages claimed for "Linsoil" over linseed oil are its greater degree of purity than that of the linseed oil usually procurable, better penetration, harder finish, with greater protection against moisture and other atmospheric conditions. Paint mixed with it is less liable to crack, scale or blister, and seems to have a better wearing quality generally. Possibly no section of the country affords a severer test for the lasting qualities of paint than Florida. There it is subject to a great deal of water, for much rain falls

in Florida, and to a lot of sunshine, for the sun shines hot in Florida. The air in much of Florida is salty also, causing rapid evaporation and calling for great power of resistance against cracking and scaling. All these conditions the "Linsoil" mixed paints have met, and over all have triumphed.

The dryer made by the Southern States Refining Co. is called "Taylorine," in compliment to the inventor of the process by which it is made. It is an absolutely colorless substance, as clear as the purest water, for which it might easily be mistaken. It is made by distilling the vapor that rises in the retorts in which the petroleum and other ingredients are being heated to make "Linsoil." This vapor is caught in pipes and carried through a coil, over the outside of which cold water slowly and continually trickles, thus setting up an evaporation that quickly cools the vapor inside, reducing it to a liquid state, and it flows out absolutely pure.

"Taylorine" is used in the same manner and for the same purpose in painting as spirits of turpentine, and possesses some advantages over the latter that should serve to make it come into popular use. It will be found superior to turpentine for white work, and especially in "flat" work, because it will not be creamy, and as it "sets up" a little more slowly, one man can apply it without showing "lapping." It is already known as "the dryer that leaves white paint white."

Another feature, and an important one, is that it is without the pungent odor that turpentine carries, a feature that will unquestionably make it extremely popular for inside finishing. A room finished with "Taylorine" can be occupied immediately afterwards with no unpleasant effects. This should make it popular also with painters, for, as is well known, the use of turpentine is not only unpleasant to the painter while actually engaged in applying it, but is actually deleterious to his health, and frequently causes him much suffering. "Taylorine" cuts varnish equally well with turpentine, and will be found an ideal product for the purposes for which it is intended.

"Taylorine" has been found to be a superior cleaning liquid also, useful in removing grease and other objectionable substances from fabrics of all kinds—silk, woolen and cotton cloths. It is pronounced superior to gasoline for cleaning purposes by many of the Jacksonville cleaning establishments.

The builders of two of Jacksonville's most notable structures have shown their faith in "Linsoil" and "Taylorine" by their works. When the Seminole Hotel, one of the chief hostleries not only of Jacksonville, but of the South, was ready for the painter's brush, it was decided to use these products of a Jacksonville man's genius both inside and out. The hotel was finished in 1909, and the paint and varnish laid upon it then are there to tell their own story. When the time came to apply the brush to the Heard National Bank Building, Jacksonville's first 15-story skyscraper—not entirely finished when this article is being written—the contractors, being fully informed as to the virtues and shortcomings of linseed oil and turpentine, thoroughly satisfied themselves of the virtues of "Linsoil" and "Taylorine" and ordered their painters to use the latter materials. The Heard National Bank Building is on the same block with the Seminole Hotel, and proof of the virtues and faults of "Linsoil" and "Taylorine" lay too close at hand for the painting contractors to adopt them without informing themselves fully of the result of doing so.

While the sales of the products of the Southern States Refining Co. have been confined so far to a small territory, it is the intention to push them throughout the entire country as rapidly as possible, and to that end the sales department has been put under the management of a man of wide experience in the oil business. Meantime, it is expected that the capacity of the manufacturing plant will have to be enlarged in the immediate future, as its output now little more than meets the demand already made upon it.

The men at the head of the Southern States Refining Co. are of well established business ability and reputation, of enterprise and activity. Mr. Gus Muller, the president, is a prominent and successful business man of Jacksonville, a city official, holding a responsible position, and his name is a guarantee of the application of sound business principles to the affairs of the company. The vice-president, Mr. John J. Ahern, is a prominent real estate dealer, and a man who is recognized as a leader in the public affairs of the city—a man accustomed to succeeding in his undertakings, and whose name is an inspiration of confidence. The management of the manufacturing part of the business is in the hands of Mr. J. E. Taylor, whose labor and investigations made the company possible, and his son, Mr. C. E. Taylor, who is fully conversant with the practical side of the manufacturing business.

These men and their associates, confident that their products are of superior merit, and that there will be a large demand for them when that merit becomes established in the minds of the people, are pushing the business in every department, and soon "Linsoil" and "Taylorine" will be known and for sale in every section of the country and in every country of the world.

In the world of today articles of commerce must stand strictly on their merits, and not merely upon their reputations. The time has gone by when the business man will buy an article or the artisan use a tool simply because his father did. The business man buys the article that possesses the merit, the artisan uses the tool that will best do the work, regardless of what others have done under similar conditions. Upon this modern basis "Linsoil" and "Taylorine" will inevitably soon come into general use.

Engaged in the manufacture of articles of universal necessity, with the world as its market, with raw materials practically inexhaustible, under competent management and commanding ample capital, the future for this new concern seems especially bright and its success assured.



# The Wauchula Development Company and Its Wonderful Combination Soils



**FLORIDA** offers many inviting opportunities to the man of intelligence and industry who wishes to change his location. In every section of the State may be found combinations of soil and climate that render such sections adaptable for one or another branch of farming. In one it may be the growing of grain and general field crops; in another the raising of truck; in a third the products of the citrus grove; in a fourth live-stock. All are good; competencies can be secured by the man who intelligently works and saves in any. But there is one section in which all these conditions meet—where grain, potatoes and other field crops grow abundantly; where trucking pays large returns for labor and money expended; where citrus groves reach their highest state of perfection, and their yield is unsurpassed; where cattle and hogs and poultry thrive throughout the entire year and every season thereof—a section where nature has been even more prodigal of her gifts than in the others. This section may be found in DeSoto county, in the Peace River Valley, the chief town of which is Wauchula.

In the early nineties Eugene Holsinger, a young Tennessean, went to Florida, and with some associates secured by purchase 54,000 acres of land in the northwestern corner of DeSoto county. The land was bought for the timber, with which it was heavily covered, and since that time the owners have cut from it many million feet, much of which has been manufactured into boxes, barrels, crates and hampers for the shipment of fruits and vegetables. Being engaged in the lumber business, and not in selling land, Mr. Holsinger and those associated with him declined to dispose of any of their realty, keeping it together with the idea of some time putting it on the market after all the timber had been cut.

In the autumn of 1910 W. O. Gandy of Indianapolis, a banker and land dealer of many years' experience, determined to secure a large body of land that could be cut up into small tracts and sold to farmers under guarantee of good value for their money. He sent out a representative who, after looking at many tracts in many States, decided that this 54,000 acres in the Peace River Valley was the tract he was looking for. He let Mr. Gandy know of his decision, and that gentleman visited the land and agreed with the finding of his representative. But the owners refused to sell, and Mr. Gandy returned in disappointment to his home. Shortly afterwards the business men of Wauchula by petition requested the owners to cut up their big tract and put it on the market. This they agreed to do, and so informed Mr. Gandy, who returned to Florida, took a half interest in the land and organized the Wauchula Development Co. to take it over and put it on the market. Of this company Mr. Gandy is president; Albert C. Carlton, a Wauchula banker, is vice-president; A. G. Smith, a Wauchula capitalist, is secretary, and Eugene Holsinger, president of the Florida Citrus Exchange, treasurer of the Swan-Holsinger Company, investment bankers, Tampa; president of the Wauchula Manufacturing & Timber Co., and member of the Tampa Board of Public Works is treasurer.

So officered, the company is its own best guarantor, though every man having official connection with it can command the written guarantee of the best business institutions of the community in which he lives and does business. These matters are mentioned here because every prospective purchaser should know something of the responsibility of the man with whom he proposes to deal even before he examines the land offered him. The men at the head of the affairs of the Wauchula Development Co., therefore, not only welcome such personal investigation, but they invite it.

DeSoto county is far enough down the State to be warm the year around, and beyond the line of danger to trees from freezing weather and to put its products in Northern markets when supplies are low and prices high, yet well above the low, overflowed lands that abound nearer the extreme southern end of the peninsula. The lands of the Wauchula Development Co. have an elevation of from 107 to 125 feet, affording excellent natural drainage, while obviating the necessity of irrigation.

Florida soils are of three general classes—high, dry sandy land, of which there is a large quantity on the ridges, and which is only available for a few purposes, and then only by reason of heavy fertilization; low, swampy hammock and prairie lands in the overflowed districts, very rich, but entirely valueless until drained; the sandy loam of the rolling, long-leaf pine lands, of which there is comparatively little, and which is held in high esteem as the best all-purpose land in the State. The Wauchula section is composed almost entirely of this latter class. It is long-leaf pine land, high and rolling, rich in humus, with a dark vegetable mold underlaid by a chocolate-colored clay subsoil, lying from twelve inches to eight feet beneath the surface, and this underlaid, in turn, by a highly calcareous marl.

The State Commissioner of Agriculture says of this kind of soil in his eleventh biennial report: "The fertility and durability of this character of land may be estimated from the well-known fact that, in the oldest-settled districts, this kind of soil has been cultivated for as many as twenty years successively in corn or cotton without a pound of fertilizer, and is still as productive as ever. It is on this class of land that both truck and fruit-growing are most successful." For these reasons the Wauchula Development Co. feels justified in claiming for its lands that they constitute the best body of "combination" soil in Florida—the soil that is best adapted, by reason of richness, drainage and yet abundance of moisture, to the successful and profitable production of both citrus fruits and vegetable crops. And with all its richness it is yet so "sweet," and it will grow good crops as soon as it is cleared.

The claim is not made for these lands that they will continue to produce good crops without being fertilized. There is no land anywhere from which

crops can be continually removed without by some means restoring to the soil those elements that are taken from it. Some soils will stand such treatment for a number of years, but finally they will become non-productive, and must be rebuilt at considerable expense. The Wauchula soils require fertilizing, and it should be done intelligently and consistently each year if the best results are to be obtained. Properly treated, they are indestructible. Those who have secured the best results from trucking and fruit-growing use from 500 to 1000 pounds of fertilizer to the acre each year to the main crop. This may be cucumbers, beans, tomatoes, Irish potatoes, or any one of half a dozen others, and it may be followed by corn or some other crop, and that, in turn, by crab grass for hay without further fertilizing. The corn will bring from 30 to 60 bushels to the acre, and the crab grass from 5 to 10 tons. The climate thus enables the farmer to secure the full strength of the fertilization by gathering three crops annually from the same field. And if, as is often the case, these three crops are taken from land already set in citrus trees, the trees are themselves benefited by the fertilizer which has so greatly helped the others, and no additional fertilization is required for them.

The value of this combination soil to men seeking to secure the best results with little money is apparent to those who give the subject some thought. Citrus fruit is the most lucrative crop that can be grown in Florida, and practically every man who goes into the State with the purpose to secure land and build a home does so with the ultimate intention to have an orange or grapefruit grove. If he has only sufficient means to make the first payment on his land and then pay for clearing and planting it, unless he can raise other things on it in the meantime, he is likely to find himself unable to wait for his grove to mature. In the Wauchula country he need have no fear, for after clearing his land and setting out his grove he can plant between the rows of trees such truck crops as he thinks will pay him best, and thus make the living for himself and family until such time as the grove shall furnish that support. This plan has been followed by a number of men who are now among the important farmers and fruit-growers of the Peace River Valley, with comfortable homes, snug bank accounts and citrus groves that enable them to increase their deposits with each recurring year. However, it is unwise for any man to go to any part of Florida without sufficient money to pay his expenses for a year after making the first payment on his land. Men have done so and have succeeded, but many more have tried it and failed. But the man who goes to the Wauchula section with enough money to make his first land payment and then to support him while he gets his farm in cultivation and procures a crop will have no trouble in making a success if he works industriously and manages intelligently, and it will be but a matter of time, and that short, until he can amass a competency.

The Wauchula section is not below the frost line. No acre of ground in Florida is. Key West, the southernmost point in the United States, is visited by occasional frosts. But the Peace River Valley is so protected that such frosts as occur there have little effect on the groves, and the soil is so well drained that trees have lived there through weather that killed entire groves much farther south. Very few trees in the Peace River Valley were killed by the freeze of 1895, which destroyed a very large percentage of the groves of the State. That freeze, in fact, proved a blessing to DeSoto county by its illustration of the fact that, while there was great destruction of trees elsewhere, there was practically no harm done in DeSoto. In this way that county, therefore to a large extent overlooked, was brought to the attention of those contemplating Florida investments.

The mean annual temperature of the Peace River Valley, as recorded by the Weather Bureau for the past fourteen years, is 72.4 degrees. The maximum temperature reached at Wauchula is 98 degrees, and that has been but seldom.

There are three railroads in DeSoto county—the Atlantic Coast Line, whose main line traverses the county's entire length from north to south, and which has a branch extending from the main line into the county a short distance west of Wauchula; the Charlotte Harbor & Northern, which skirts the western border, and the Wauchula, Atlantic & Gulf, which runs east and west through Wauchula and forms junctions with both the others. These roads put the Peace River Valley farmers on an equal footing with the best in the State with respect to transportation facilities.

The crops principally grown are beans, peas, tomatoes, onions, peppers, cucumbers, potatoes and melons. Experiments made with celery show that the lands of the Peace River Valley will bring as much and of as good quality as those of the Sanford section. In fact, any kind of truck or table vegetable that can be grown anywhere in Florida can be produced in the Wauchula section, and most of them to much better advantage than anywhere else in the State. Strawberries yield abundantly and of a good quality. Grapefruit and orange trees grow vigorously, attain great height and put out thrifty branches that furnish large bearing surface. A ten-acre grove after reaching bearing age is good for a yearly income of from \$3000 to \$7500 for its owner.

The Wauchula Development Co. has divided its lands into lots of ten and twenty acres each, so laid off that each lot faces a thirty-foot road. The land is for sale at low prices and upon the most favorable terms, enabling the man who is willing to work to make a start with less money and acquire a competency in less time in the Peace River Valley than in any other place in the United States.

The offices of the company are at Wauchula and Tampa, Fla., from either of which full information will be sent to anyone who applies for it.

# Fellsmere Farms: America's Broadest Land Reclamation by Private Capital



PARTS OF FELLSMERE IN ITS ORIGINAL STATE.

**C**OMPREHENSIVE in conception, broad in design, combining engineering ability of the highest order with great foresight in soil selection, the development at Fellsmere Farms, Florida, constitutes one of the largest and most important land reclamation propositions now being carried forward in this country. It embraces the drainage and rendering fit for cultivation of 118,000 acres of land of the richest character for intensive and general agricultural and fruit-growing purposes—land that has lain for ages wild, water-covered, inutile for man's purposes: the preparation of an unproductive waste to support a population of 25,000 to 30,000 people.

The land chosen for this great undertaking constitutes a portion of the country tributary to the St. Johns River. It has 23 to 25 feet elevation above the sea level at the mouth of the river, hundreds of miles north. The trained eye and comprehending mind of the skillful engineer who was called on to provide a plan for reclaiming the land and making it fit for agricultural purposes saw that the way to get the water off the land was not by way of the St. Johns River, towards which it already flowed its sluggish way, but by seeking an outlet through the Sebastian and Indian rivers to the sea, which lies only a dozen or less miles east from the heart of the land. The contour of the ground here is like that of a broken platter, with the low eastern rim still intact, while that toward the north and west has been broken away, allowing its contents to spill in that direction. The drainage plan was to cut through this unbroken rim and divert the course of the water from a northerly to an easterly direction, thus taking advantage of the same fall in a dozen miles that nature had provided for it in more than three hundred. So from the eastern edge of the tract an outlet canal was cut through this platter-rim to the Sebastian River, 4½ miles away. This is joined by a main canal running entirely through the property east and west, into which the water will be carried by a system of laterals and ditches covering the entire tract.

The Fellsmere Farms property embodies four townships lying in St. Lucie county and one in Brevard county. The four in St. Lucie lie in a square, compact body, practically twelve miles square, and that in Brevard, six miles square, adjoins the northwestern township in St. Lucie. Over the eastern portion of the tract is an area of some 15,000 acres of the land known as "pine" land, being covered by a scattering growth of pine timber. The soil here is light, sandy, porous and very friable. It is the typical citrus fruit soil, such as is found in the productive groves of the famous Indian River section, of which it is a part. Immediately west of this pine land are 33,000 acres of prairie land, a dark sandy loam, very rich, easily workable and highly productive under proper treatment. In its natural state it is covered by a heavy growth of grass. The remainder of the tract, some 70,000 acres, is "muck" land, formed by the decomposition under water of the vegetable

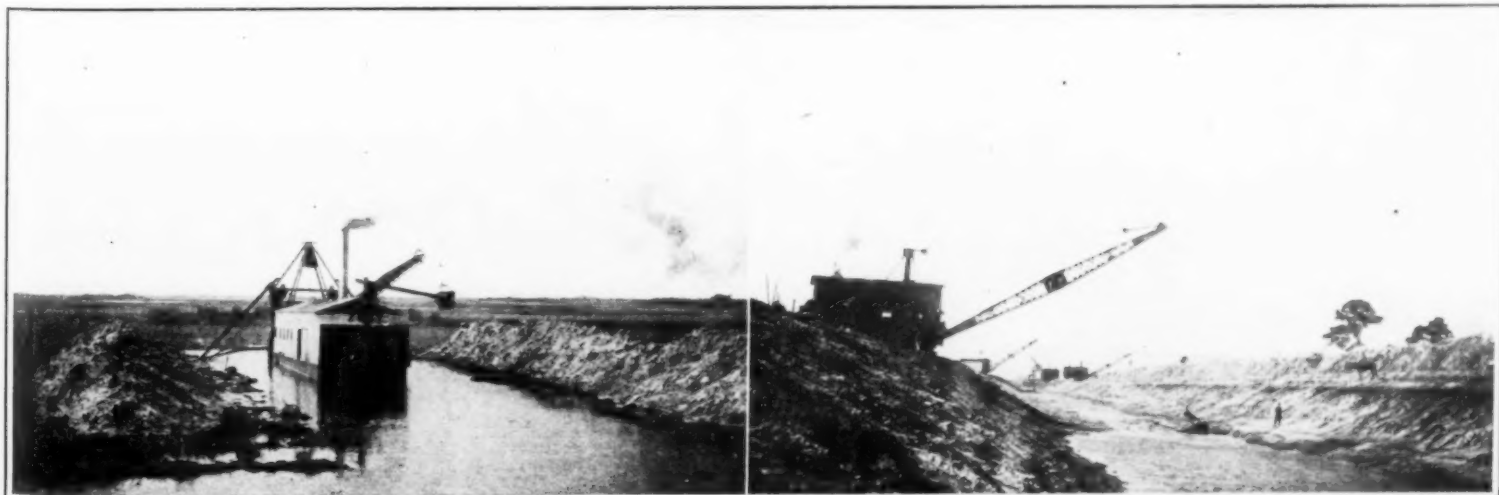
matter that has grown up there throughout the ages. This soil is deep, and rich, and highly nitrogenous, and while not so easily cultivated at the start as are the sand and loam of the pine belt and the prairies, after being worked over a few times, it becomes just as "tractable," and, if anything still more productive. The entire tract is underlain by a subsoil of blue clay and marl, thus supplying the lime element to give the necessary "sweetness" to the soil, and at the same time so impenetrable by water as to retain the moisture throughout the occasionally dry winter season.

The solution of the drainage problem was placed in the hands of J. G. White & Co., the well-known engineers of New York, and they sent to the work some of their most talented and skillful engineers. The plan mapped out, and which is being followed rigidly, begins with the outlet canal mentioned above. This canal is 100 feet wide at the top and 50 feet wide at the bottom. It is from 12 to 18 feet deep, and runs 4½ miles from a point two miles west of the northeast corner of the property to the Sebastian River, a short distance from where that stream joins the Indian River. Flowing into the outlet canal and extending eight miles west along the north line of the southern four townships is the main canal, 50 to 65 feet wide at the bottom and 10 to 12 feet deep. At intervals of two miles laterals running north and south through the property empty into the main canal. These laterals are from 6 to 10 feet deep and from 22 to 45 feet wide. They will total, when completed, 66 miles in length. At each quarter of a mile will be a sub-lateral ditch running east and west and emptying into the laterals. These will be from 2½ to 5 feet deep, according to the character of the soil through which they are cut, and their aggregated length will be 700 miles. Under this plan no point on the farm of any man can be farther than 650 feet from a sub-lateral ditch. Into these sub-laterals, of course, other ditches will be let by those property owners whose lands need still further draining. These farm ditches will be short and easy to cut.

Lying along the western boundary of the Fellsmere lands is Lake Wilmington, a beautiful body of clear, fresh water, covering an area of about seven square miles. The drainage plans embrace the lowering of the water in this lake some five feet. This will not only protect the surrounding lands from an overflow of the water of the lake, but will also create many beautiful building sites upon its borders.

Having before them the figures showing the average annual rainfall in that portion of Florida—some 55 inches—the engineers have calculated just how much water-carrying capacity the canals must have to properly drain the property, and have provided amply for every contingency, so that when the work is done there will be absolutely no probable emergency unprovided for, and every acre of every subdivision can be walked over dry shod.

For the purpose of insuring the perpetual drainage of the property, for



PROGRESSIVE STAGES OF CANALS' CONSTRUCTION.





SUGAR CANE, EIGHT MONTHS' GROWTH.



A TOMATO FIELD IN JANUARY AT FELLSMERE.

which a certain amount of maintenance work will be necessary, a Mutual Canal Company will be organized by the Fellsmere Farms Co., and will be controlled by people who purchase farms on the Fellsmere tract. This company will issue one share of stock for each acre of land sold, and the stock will be owned by the owners of the land. The Fellsmere Farms Company will turn over to this company cash, negotiable paper and machinery equal in value to \$2 for each acre sold up to 100,000 acres, thus creating a fund that will amply care for the work of keeping the canals open and in proper condition perpetually.

In the matter of transportation in its broader phase, the Fellsmere property is quite well provided for now, and extension will be made here, as along other lines, as the development work progresses and necessity arises. The Fellsmere railroad has already been built from Sebastian, on the Florida East Coast Railway, to the town of Fellsmere, some nine miles distant, and on past that point two and a half miles to the first of the main laterals lying west of the town. The grade for the road has been thrown up for a distance of several miles farther west, and it is a matter of a short time only until it will be extended entirely through the tract. The Fellsmere railroad is now in operation as a common carrier, running trains daily between Sebastian and Fellsmere, carrying freight and passengers, express and mails. In addition to the regular train service the company maintains two gasoline railway motors for carrying visitors to and from the railroad at Sebastian at odd hours, and for use generally on the line of the road. The railroad ultimately will be carried on a distance of some 30 miles from its eastern terminus, to a connection with the Kissimmee Valley branch of the Florida East Coast Railway, now being built from Titusville to the north end of Lake Okeechobee. This will give the people of Fellsmere Farms convenient railroad outlet on two different sides.

Here, then, are two of the great essential features of successful land development being worked out in the most complete and thorough manner—soil properly prepared, transportation provided. Other matters needful in building up a new community have been looked after with equal care. Among these is the preparation for a town, a central trading place where the large population for which the development is intended can secure the various articles of merchandise and manufacture necessary to sustaining life and prosecuting their work, and where, through organized selling associations, the farmers, truckers and fruit growers can later market their products to the very best advantage.

This town, Fellsmere, is already a thriving community of more than 500 people.

These are, in a general way, the chief points in this broad plan of development—the rescue of 118,000 acres of soil of great productive potentiality from a state of unproductiveness and preparing it to become the home and furnish the living of thousands of prosperous and progressive people. That the drainage plan contemplates the enormous work of removing 7,000,000 cubic yards of earth is a matter of great importance to the men who have invested their money in the proposition, but to the man who goes to Fellsmere to buy a home and to make his living from the soil, the interesting facts are that the plan for draining the land is successful, and that when he goes there to take charge of his property he will find it fully prepared for the beginning of work.

The Fellsmere Farms Company is not content to stop with the drainage of the land and the furnishing of transportation facilities—it takes upon itself the burden of demonstrating the fitness of the soil it sells for the various purposes to which it is adapted, and of teaching those who purchase farms what to plant to bring the best results, and how to put in and care for the various crops. To this end two demonstration farms

have been established, one on the prairie land and the other in the muck, both in charge of a practical farmer who has spent many years in Florida, and who probably knows as much as any man in the State concerning the preparation and cultivation of the lands, the kinds of crops to plant in the various characters of soil, and the best manner of caring for them to secure the largest yields and at the proper seasons when prices are best.

The farm on the prairie land was first established, because that was the land first ready, and is now in its third year of operation. Upon it are abundantly grown many kinds of truck—tomatoes, onions, cabbage, cauliflower, eggplant, sweet peppers, turnips, beets, beans, peas, celery, spinach, carrots, cucumbers, radishes, lettuce, asparagus, okra, sweet potatoes, Irish potatoes, watermelons, canteloupes, corn, strawberries. Each of these articles yields abundantly, and a crop can be matured at Fellsmere at a time when the highest prices are being paid in the markets of the North. For instance, this article is being prepared during the week before Christmas, and at this time there are ready for use in the garden on this demonstration farm cabbage, snap beans, radishes, English peas, spinach, eggplant, tomatoes, peppers, onions and strawberries. And not only upon the demonstration farm, but upon other farms are the same crops ready for market, though possibly upon no other one are there so many different crops. Nor are these crops grown merely to show what can be done. They are of commercial size, and will be handled commercially.

The demonstration farm is not devoted to the raising of trucking crops exclusively. It has devoted sections also to growing sugar-cane, cotton, rice and numerous grasses and provender crops. Sugar cane has been found to yield heavily, the crop this year running from 40 to 50 tons to the acre. The product is very high in the qualities that enter into sugar, and there is no doubt that cane will be found a most profitable crop on these lands. The cane is planted on prairie land, which it not held in such high esteem for its growth as is muck land. Still better results are expected from experiments to be made on the latter. It is the intention ultimately to secure the location of a sugar mill on this property, where each planter of cane can find a market for his crop, though it is not expected that the yield can be raised sufficiently high for some time to justify such a plant. Meantime a syrup-making plant is in contemplation, and will probably be installed, for there are few crops that bring larger returns to farmers than sugar-cane made into syrup. The market for the output is unlimited and the prices always good. Each farmer will be persuaded, if possible, to devote a few acres to the growing of cane, as a staple and dependable crop, and one from which ready money can always be secured. In this climate one planting of cane lasts for several years, probably from five to seven, and only needs proper cultivation to make it bring forth an abundant crop annually.

Experiments made with sea-island cotton were more than satisfactory, the yield being large and the fiber long. This cotton always brings a price in the market far beyond that of the ordinary upland cotton, and the demand has

always exceeded the supply. It will unquestionably prove an excellent staple money crop for the Fellsmere farmer. The yield in money on these lands will probably average twice that of the ordinary quality of cotton, and it is neither more difficult nor more expensive to produce.

Para grass, Rhodes grass, rice, Kudzu, Japanese cane, cowpeas, velvet beans and other forage crops have been tried with success, and there is no question of the ability of the Fellsmere farmer to raise at home all the feed he needs. Para grass planted on the demonstration farm yielded the first year 12 tons to the acre. The hay is very nutritive and the grass is



INSPECTION TRIP PARTY IN FELLSMERE CELERY FIELD, MARCH, 1912.

expected to become popular with Fellsmere farmers as a provender crop.

While the Fellsmere development is yet too young for a demonstration to have been made as to the value of the lands for citrus fruit culture, there is no room for doubting that oranges and grapefruit will grow there to their highest state of perfection. The eastern boundary of the tract joins the famous Indian River lands, well known for the fine quality of their citrus fruits, and the soils of the pine and prairie lands of Fellsmere are identical with those that have brought fortunes to the Indian River growers. Young trees, set out within the last year or two, give every evidence of thrifty growth, and it is expected that the next three years will witness a number of groves coming into successful bearing at Fellsmere. A considerable nursery of both orange and grapefruit trees has been established, and those who wish to plant out groves will have an opportunity to secure well-started native stock.

It was less than three years ago that the tract of land now known as Fellsmere Farms came into the possession of its present owners, and the time has been too short to make a successful demonstration of the amount of money to be made off the various kinds of crops, but from similar Florida lands properly drained and intelligently cultivated yields have been made as follows:

Oranges .....	\$900 an acre.	Lettuce .....	\$700 an acre.
Grapefruit .....	1000 an acre.	Cucumbers .....	250 an acre.
Strawberries .....	800 an acre.	Asparagus .....	300 an acre.
Celery .....	900 an acre.	Watermelons .....	250 an acre.
Irish potatoes .....	500 an acre.	Bermuda onions .....	500 an acre.
Sweet potatoes .....	400 an acre.	Peppers .....	800 an acre.
Eggplant .....	200 an acre.	Cauliflower .....	350 an acre.
Beans .....	250 an acre.	Cabbage .....	250 an acre.
Corn .....	100 bushels.	Alfalfa .....	250 an acre.

It is expected that often yields such as these will be made by the Fellsmere lands, intensively cultivated and with products properly marketed, though the average will be less. It will be noted also that the figures given above show merely what the land can produce in one crop, and consideration must be given to the fact that the semi-tropical climate of middle Florida permits the gathering of from two to four crops each year from the same land where a proper system of diversification is followed.

One attractive feature of life at Fellsmere is the delightful climate.

The location is 175 miles south from Jacksonville, as the crow flies, so far south that it is free from freezing weather, yet so close to the Gulf stream, with its never-failing breeze, that the heat of summer is tempered to a degree that renders it always pleasant. Therefore, both in winter and summer the climate of this part of Florida is agreeable. The average temperatures through the year are as follows:

January .....	62.7	May .....	76.6	September .....	80.5
February .....	64.2	June .....	79.4	October .....	75.5
March .....	69.1	July .....	81.4	November .....	69.2
April .....	72.2	August .....	81.7	December .....	64.8

During the heated term of 1911, when the entire North was sweltering in temperatures that soared around and above the hundred mark, Fellsmere's warmest day saw the mercury go only to 93.

The mild climate not only permits the farmer to work in the open the whole year round, but it also affords the sportsman the best of opportunities for hunting and fishing. The forests abound in game of many kinds, the fields furnish birds to the gun of the hunter, ducks swim the streams by untold thousands in season. The Fellsmere farmer need go no farther than the nearest canal to secure all the fish his family can consume, for the canal waters are full and the supply seems inexhaustible.

Conditions for poultry raising seem to be perfect at Fellsmere, and many chicken yards are seen throughout the community. High-bred fowls are being raised by a number of people, and the long-laying season makes poultry a remunerative business. The mild weather throughout the year is conducive to the rapid growth of the young chicks, while prices for both chickens and eggs are good at all times.

Another thing demonstrated successfully by the company on its demonstration farm is the fact that Fellsmere is a good place for dairy cattle. A considerable herd of good milk stock is kept, and the cows are not only thrifty

and healthy, but they also give an abundance of very rich milk. The all-the-year-round grazing, the abundance of green food, and the nutritious forage that is so easily produced here combine to make conditions well-nigh ideal for dairying.

The supply of pure water at Fellsmere is boundless. Driven wells strike an ample flow at a few feet, and any man can put down his pipe, rig up his pump and have a supply of good, pure water in a very little time. If a larger flow is wanted an artesian stream is struck at 350 feet, reaching its maximum flow at 400 feet depth. A number of these deep wells have been put down on the property, and the flow from them is such as to insure an ample supply for household, stock and irrigation purposes. The natural pressure is sufficient to carry the water anywhere it is wanted in the ordinary course of farm life.

By the time the drainage plans have been carried out the company will have spent upon the property a million and a half dollars, in addition to the purchase price of the land, an amount too great to be put into any reclamation scheme except of the highest class, or to be jeopardized by hurrying people onto the land before it is ready. The character of the men forming the governing body of the company—its officers and directors—is a sufficient guarantee of sound business methods in the commercial handling of the property. The men who direct the affairs of the Fellsmere Farms Company are well known in many big undertakings, and they could not afford to promote any development that was not founded on merit. These men are:

President, Oscar T. Crosby, Warrenton, Va., president Trenton & Mercer County Traction Corporation, director J. G. White & Co., Inc. For many years Mr. Crosby has been known throughout the world as one of its foremost electrical engineers.

Vice-president, E. Nelson Fell, Warrenton, Va., engineer of large experience in the United States, British Columbia and Russia.

Secretary and treasurer, T. F. Sherwood, of O'Connor & Kahler.

Directors: Oscar T. Crosby, E. Nelson Fell, Charles B. Eddy, New York, president of the Durham Coal & Iron Co. of Tennessee, a capitalist of large experience in great railroad and industrial operations; Ernest H. Every, Fellsmere, Fla., manager Fellsmere Farms Company in Florida; E. M. Farnsworth, Boston, Mass., of E. M. Farnsworth & Co., bankers; Harry A. Kahler, New York, of O'Connor & Kahler, bankers; Frank Battles, Battles & Co., bankers, Philadelphia;

George S. Pingree, Boston, Mass., of Pingree, McKinney & Co., bankers; Stephen L. Selden, New York, assistant to president J. G. White & Co., Inc., engineers; Harold Stanley of J. G. White & Co., New York; P. Vans Agnew, Kissimmee, Fla., attorney at law; J. G. White, New York, president J. G. White & Co., Inc., New York, and chairman J. G. White & Co., Ltd., London.

The company numbers among its stockholders many other men of high standing in the business and professional life of the country, men whose names guarantee the good faith of any enterprise with which they are connected.

The sales of the Fellsmere Farms Company are in the hands of the Fellsmere Sales Company of 55 Liberty street, New York, and Fellsmere, Fla., of which E. Nelson Fell is president. The Sales Company has sent its agents and representatives into all parts of the country to sell the property, thousands of acres of which have already found purchasers. Every State in the Union is represented among the purchasers of Fellsmere farm lands, and even from Canada and other foreign countries buyers have come also. In fact, the sales have run many thousands of acres ahead of the drainage, those purchasing being willing to buy with the full knowledge that their holdings were not yet ready for the plow.

This, then, is the story of the Fellsmere Farms development, said by experts to be the most complete in plan and execution to be found anywhere in the country, and of greater size than any other now being financed by private capital.

The lands have nearly doubled in price since they were first put on the market a few months ago, and yet there are few purchasers at the original price who would be willing to sell their holdings at those now prevailing.

No other development can be called to mind in which so many desirable elements combine to make for the progress and prosperity of the community and the happiness and contentment of the individual. Great capital, great engineering ability and a great tract of splendid land are combined in this truly colossal undertaking.



A MIDWINTER CROP OF EGGPLANT AT FELLSMERE.



# The Houston of Today and Its Foundations for a Vastly Greater Future

By JEROME H. FARBER, Director of Publicity,  
Chamber of Commerce, Houston, Tex.



IN another fifteen months the world will have heard of the opening to sea-borne traffic of unbroken cargoes of the Houston Ship Channel.

Practically simultaneous with the grand inaugural of the great waterway on the Isthmus in 1914 Houston's improved deep waterway, "the Eastern terminus of the Panama Canal," will be completed and the gates of the port of Houston flung open to ocean traffic from the ports of the world.

In June of next year the Government engineers estimate the entire length of the Houston Ship Channel will have been dredged to a minimum depth of 25 feet and the turning basin at the upper terminus improved to facilitate the turning of deep-sea vessels, as well as providing facilities for adequate free wharfage.

An average in excess of a half-million cubic yards of silt is monthly being removed from the channel by the five dredges constantly at work. In length of channel completed the monthly average is around 8000 feet. As the dredges progress in removing silt from the bottom of the channel "ease-ments" are being made in the bends, which means the slicing off of noses and the straightening of the channel.

The improvement work on the Houston Ship Channel is the greatest single item of waterway improvement of its kind now under way in the United States. Recognizing Houston's strategic position in the handling of commerce from the great trans-Mississippi country, seeking tidewater at the nearest point, the Federal Government is aiding the achievement of Houston's ambition by appropriating \$1,250,000 for the work. Houston has added an equal amount, making the total appropriation for the improvement of the channel \$2,500,000.

The work of the channel is being undertaken in three divisions, all under the direction of Federal engineers. All work thus far completed has been done in the last two divisions, which lie between the Turning Basin and Morgan Point. The other division is between Morgan Point and the point where the channel connects with the Galveston channel. In this division the channel runs through Upper Galveston Bay. It is known as the old Morgan cut, and for a greater distance is protected by revetment work. The only work in this division is the deepening of the channel, already surveyed and partially completed, and the repair and extension of the revetment, which protects the channel from seepage through the action of cross tides and currents.

From Morgan Point to the Turning Basin the course of the channel is through San Jacinto Bay, San Jacinto River and Buffalo Bayou, a natural arm of the sea. The Turning Basin at Houston is a great man-made cut in the open prairie, and at the present writing measures 1300x600 feet, with a varying depth of from 20 to 35 feet. The City of Houston has expended \$150,000 in further excavating at the Turning Basin for slips. The Government plan contemplates still further improvement of the Turning Basin, which will be made when the dredges reach that point.

Houston's rightful territory extends from the western banks of the Mississippi River to the eastern slopes of the Rocky Mountains and from the Gulf of Mexico to the Canadian boundary.

For all this vast area Houston brings tidewater 500 miles nearer than any port on either the Atlantic or the Pacific and 300 miles nearer than New Orleans.

Houston's proposition is that the deep-water haul of unbroken cargoes shall be extended 50 miles farther inland. The cost of water transportation, approximately, is only one-sixth as great as the cost of rail transportation. If the huge volume of traffic to the Texas coast can be given 50 miles more water haul and 50 miles less rail haul, the saving in transportation cost to the shippers and consumers will rapidly mount into the millions and ultimately into hundreds of millions of dollars.

It is this fact precisely which has caused all the world's great harbors, which men have created or improved, to be located as far inland as possible. The saving in cost of transportation in a few years pays the cost of harbor construction, and thereafter permanently sustains a great city, manufacturing and trading in commodities around the harbor.

The two principal harbors of Northern Germany are those of Hamburg and Bremen. In each instance the harbor is situated farther inland than Houston's harbor, and in each case the inland harbor has been almost wholly man-made. In each case the harbor-builders had as a basis for their work a city already established, with a river flowing through it. Houston has exactly these advantages. Houston has not yet so large a population back of it as have Hamburg and Bremen, but the American Southwest and the American Northwest, regions which by virtue of the short haul must inevitably and forever patronize the Gulf gateway for their sea-borne commerce, are enormously larger than the region whose population supports the commerce which sustains Hamburg and Bremen. Moreover, these American regions tributary to the Houston sea outlet are much richer, potentially, and therefore are certain in due time to sustain a much larger population than the region tributary to Hamburg and Bremen ever can sustain.

Houston, in the Buffalo Bayou arm of the Gulf of Mexico, has a big natural waterway. Its size and natural depth are indicated by this fact: that Government engineers and responsible private contractors have engaged to give it a 25-foot channel, with a minimum bottom width of 150 feet, throughout its more than 50 miles length from Houston's ship-turning basin down to the Galveston jetties for only \$2,500,000, and have engaged to complete the work within three years from the date of beginning in 1912. Compare this with the \$85,000,000 which Manchester, England, spent on its short 29-foot canal cut inland from Liverpool's sea-front harbor, in order to save the cost of rail transportation on the product of Manchester's mills, and you will better understand how little nature left for man to do in giving Houston a broad deep-water highway direct from her great rail terminals down to the open sea.

Houston, the city, is an incident in the vast natural scheme of things which demands and insures the creation of the big inland harbor of the near future on Buffalo Bayou. This Harbor will command a yearly increasing share of the sea-borne traffic of the United States. Saving for all of that traffic five-sixths of the cost of its transportation for approximately 50 miles, this inland harbor, like all the other great inland harbors of the world, will quickly pay for itself out

## CITY OF HOUSTON

OFFICE OF MAYOR H. B. RICE

Houston, Tex., December 24, 1912.

Editor Manufacturers Record, Baltimore, Md.:

Dear Sir—I am pleased to advise you that arrangements are being made by the city and the people of Houston for the publication in your forthcoming special issue, "The South: The Nation's Greatest Asset," of an illustrated article on Houston similar in form and extent to the 10-page story of Houston which appeared in the descriptive advertising section of your recent number, "Thirty Years of Southern Upbuilding."

Houston received very widespread publicity from the former article, which was highly beneficial in establishing in the minds of your readers the aggressiveness and leadership of Houston. It called forth much newspaper comment, and brought letters of inquiry in great numbers. Our population has largely increased during the past year, building operations and public improvements are at high tide, over \$10,000,000 representing municipal and other expenditures now under way; there has been a great growth in the business of the city, and there are no vacant stores or residences here. You have greatly helped us, and I look for even greater benefit through the use of your next special issue, with its compelling title, "The South: The Nation's Greatest Asset," which, of course, it is, as all of us down here know.

Very truly,

H. B. RICE, Mayor.

This letter, together with one of similar import sent the Manufacturers Record by Mr. J. T. Scott, president of the First National Bank of Houston, demonstrates the alertness and the energy of the South-western metropolis. With the initiative of Mayor Rice and Mr. Scott, the matter of financing the same sort of representation in the Asset Number as in the Upbuilding Number was undertaken by the Houston Chamber of Commerce, and the story herewith appears, as prepared by the Publicity Department of the Chamber of Commerce. Herein are sketched the achievements of the year, the activities of the present and the plans for the greater expansion of the future. Indicative of the spirit of Houston a special commissioner, Mr. Frank Putnam, was sent to Europe last year to make a careful study of European cities in order that Houston might learn from them how best to build a great and modern city. Some of the conclusions of Mr. Putnam are incorporated in this story, much stress being laid upon the plans under way to provide a deep water harbor for Houston. He spent much of his time in Germany, and returned more than ever convinced that Houston is to become one of the great seaports of the world. He points out that what Houston is doing now is merely the beginning, for Hamburg spent \$130,000,000 in digging out the harbor as it now exists, but he says that for very many less millions Houston can secure facilities as great as Hamburg's, and with a vastly richer territory to draw from Houston is certain to far surpass her German prototype. As indicating the extent of developments at Hamburg, Mr. Putnam reports that in circling the harbor, all man-made, it took five hours' time in a fast motor boat.

The location of Houston as the farthest inland harbor on the American continent—that is, the seaport nearest the great wheat, corn, cotton and livestock producing territory of the nation—is pointedly indicated in the map printed herewith. That Houston is 500 to 700 miles nearer to the great grain regions of the West than Eastern Atlantic ports is hardly appreciated by one out of a thousand intelligent men, but it is a fact fraught with vast possibilities that mean much for Houston, but even more for the mighty empire that must have such an ocean outlet as Houston to the world's markets. The map tells a story that scarcely calls for words. The opportunity is given, and Houston hustle is relied on to do the rest.

ALBERT PHENIS.



Typical  
Public  
Buildings  
of  
Houston



Noted for  
their splen-  
did Archi-  
tecture







HOUSTON SHIP CHANNEL.

Scene taken three miles below Houston.

of that saving, and will thereafter be a national asset for economy in exporting and importing commodities exchanged with the other ports.

A feature of the Houston Ship Channel which will be a magnet to Gulf commerce will be the maintenance of free wharves. This is forever guaranteed by the City of Houston, and is one of the provisions of the Government contract. The City of Houston will construct a chain of municipal wharves and warehouses, and as is the case now and forever, shipping over the city wharves of the Port of Houston will not be subject to a wharfage tax.

Houston's pretensions to become a great seaport are valid. The similarly-situated ports of Bremen, Hamburg, Glasgow and Manchester in Europe prove it. This development will take place naturally in response to demands laid by sea-borne commerce. The region tributary to this sea outlet is vastly larger—and in years to come will become more populous and more productive of sea-borne commerce—than the region now tributary to New York.

The Houston Ship Channel is Houston's greatest commercial asset. Since the days Houston was born, soon after Texas became a Republic, the channel has been a great factor in the city's commerce. As the city grew, the commerce over the waters of the channel expanded, the first enterprise of the larger type being the Morgan Steamship Co., which established a regular line of boats over the stream shortly after the war between the States. Morgan established terminals at Clinton, six miles below Houston, and operated a regular line of boats to New Orleans.

In later years Government and State appropriations made possible the further improvement of the channel, and Buffalo Bayou was deepened from the mouth to the foot of Main street, in Houston, where the city wharves are now located. Although the Turning Basin, where the new municipal wharves will be built, is farther down the channel from Main street, the bayou from the Turning Basin to Main street will always be a factor in the city's commerce.

At present all the commerce over the ship channel comes to the city wharves or just below. In 1912 this commerce totaled \$43,437,500. Cotton was the greatest commodity handled over the channel, and for the year totaled \$23,340,000. The principal commodities received during the year over the channel were, in addition to cotton, shell, sand, lumber and shingles, groceries and provisions, rice, brick clay, grain and feed, hardware and machinery, cord wood, brick and tiling, oil and gasoline, coal, beer and ice, fruit and vegetables, fish and oysters, lime and cement, hay, furniture and pianos, etc.

The Houston Ship Channel always has been a factor in the southwestern shipping world. It has given to Houston a water rate from all seaboard points which is met by the railroads. This water rate makes possible cheaper importation and distribution to and from Houston than from any other point in the State.

Another powerful transportation factor in Houston is the number of railroads. Seventeen railroads enter Houston, which is the terminal for all. No

trains pass through Houston intact—all are broken and again made up if they are destined for points beyond.

With seventeen railroads and the sea meeting at Houston, no other city in the South can offer such unequalled advantages for cheap and quick transportation. There is no other city in the South where so many railroads converge at deep water, a situation which combines to the promotion of industry.

The manufacturer in Houston finds a combination of advantages which make unequalled this field for the profitable manufacture and sale of the products of raw materials. There is glass sand in abundance a few miles from Houston, hardwood and pine forests to the east and north of Houston, rich coal and lignite deposits, which have hardly been touched; great stores of fuel oil; rich iron-ore fields, which heretofore have not been worked on account of a lack of transportation facilities from the deposits to ports.

Texas is rich in mineral resources, and none has scarcely been touched. When all these vast fields are opened and the wealth of the earth taken out, new industries will flourish in Texas and greater rail and water shipping must be installed to carry the material to other manufacturing centers.

In this Houston will reap the direct benefit. Commerce seeking tidewater will reach ship's tackle at the most inland point, and that point will be Houston.

Shipping by rail of these commodities to market will of necessity come to Houston, as Houston is the railroad center of the State and more directly the center of these vast fields of natural deposits.

As Houston is the center of railroad activity in the State, the headquarters of the larger lines are located here. Houston is headquarters for all Southern Pacific lines in Louisiana and Texas, and the nine-story general office building of the Sunset-Central Lines (Southern Pacific) in Houston is the only office building owned by the entire Southern Pacific System. It was completed a little over a year ago, and is occupied almost entirely by the general offices of the Sunset-Central Lines.

Houston is also headquarters for the International & Great Northern Railway, the Frisco Lines and the Trinity & Brazos Valley Railway.

Further accentuating Houston's power as a railroad center the general headquarters of the Pullman Company for Texas and Mexico is located in Houston. The headquarters of the Wells-Fargo Express Co. for the Southern department is located in Houston. This department comprises the States of Louisiana, Arkansas, Oklahoma and Texas.

In the interurban department of railroad construction Houston is taking a commanding lead. The Galveston-Houston Interurban, constructed by the Stone & Webster Company of Boston, has been in operation a little over a year, and handles a large part of the traffic between the two cities.

The Interurban was constructed at a cost of approximately \$3,000,000. Three power stations supply current, the principal one being at Webster, midway between the two cities, and substations at South Houston and at La Marque. An hourly schedule is maintained. The equipment consists of ten

motor passenger coaches of the latest and most modern type, two motor baggage and express cars, four passenger trailer cars, five gondola ballast cars and five flat cars. The rail rate between the two cities was cut to \$2 for the round trip.

Other interurban projects are in process of consummation. One proposes to connect the Brownsville country with Houston; a second to operate between Houston and the beach resorts, and a third to connect Houston and North Texas. Within a few years interurban roads will radiate from Houston in all directions.

Houston is a "slogan city." Probably there is no other city in the land that can claim more notoriety or fame through the use of apt slogans than can Houston. On account of the similarity of the Manchester (England) ship canal and the Houston Ship Channel to their respective cities, Houston has become known as "The Manchester of America." Because of the great number of industries which make Houston the manufacturing center of the State, the city is also known as "The Workshop of Texas." There is still another, which suggests itself as the most appropriate—"Where Seventeen Railroads Meet the Sea." This slogan is descriptive in itself, and has attained nation-wide fame. However, the growth of Houston bids fair to compel a change in the slogan from seventeen to eighteen railroads, the eighteenth railroad to enter the city being the Houston & Brazos Valley, which has just secured terminal facilities in Houston. The other seventeen railroads entering Houston are:

- Houston & Texas Central Railroad.
- Galveston, Harrisburg & San Antonio Railway.
- Texas & New Orleans Railroad.
- Beaumont, Sour Lake & Western Railway.
- Houston East and West Texas Railway.
- International & Great Northern Railway.
- International & Great Northern Railway (Fort Worth Division).
- Trinity & Brazos Valley Railway.
- San Antonio & Aransas Pass Railway.
- Galveston, Harrisburg & San Antonio Railway (Galveston Division).
- Gulf, Colorado & Santa Fe Railway.
- Missouri, Kansas & Texas Railway.
- International & Great Northern Railway (Columbia Division).
- St. Louis, Brownsville & Mexico Railway (Frisco Lines).
- Galveston, Houston & Henderson Railroad.
- Galveston, Harrisburg & San Antonio Railway (Victoria Division).
- Texas Transportation Co.

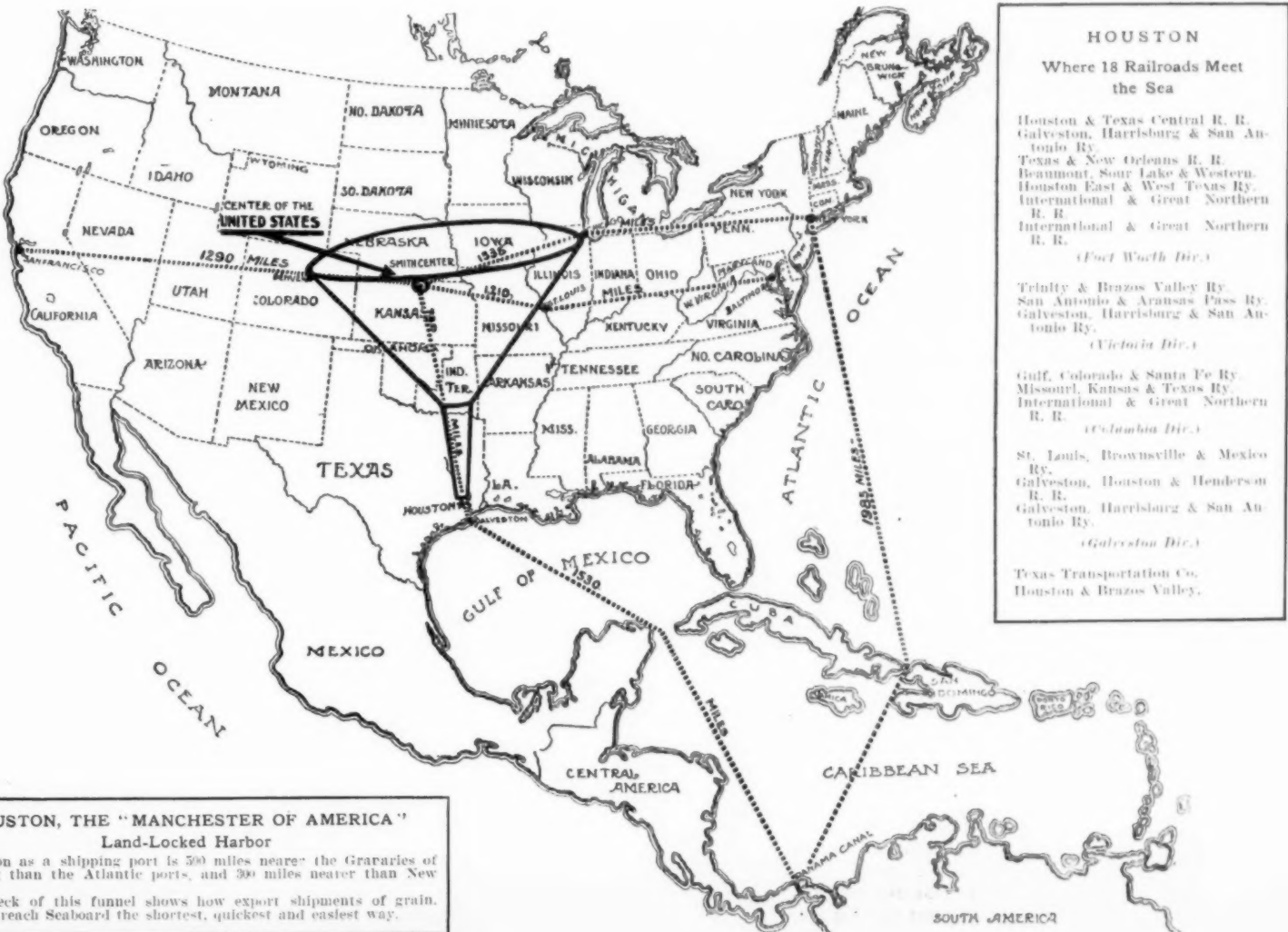
With these superb railroad facilities Houston holds a powerful position in the shipping of the Southwest. In freight matters the proximity of Houston to the producing territory and to the Gulf are of vital interest to the producer and shipper alike. Much of the interior production of the Southwest and Middle

West is destined for export, and the shortest way to tidewater is the cheapest way. How Houston is advantageously situated as the line of least resistance against which all exports from the trans-Mississippi territory seeking tidewater must come is shown by the following table:

From	To New York.	To Houston.
Guthrie, Okla.....	1675	524
El Reno, Okla.....	1733	465
Oklahoma City, Okla.....	1706	493
Arkansas City, Kan.....	1586	613
Wichita, Kan.....	1549	665
Dodge City, Kan.....	1701	860
Hutchinson, Kan.....	1570	726
Topeka, Kan.....	1415	760
Parsons, Kan.....	1412	612
Pittsburgh, Kan.....	1441	699
Kansas City, Mo.....	1348	749
St. Louis, Mo.....	1065	820
Hannibal, Mo.....	1169	916
St. Joseph, Mo.....	1373	812
Quincy, Ill.....	1175	1001
Des Moines, Ia.....	1270	970
Sioux City, Ia.....	1422	1049
Omaha, Neb.....	1415	941
Lincoln, Neb.....	1474	943
Kearney, Neb.....	1614	1079
Superior, Neb.....	1565	901
Cheyenne, Wyo.....	1934	1248
Santa Fe, N. M.....	2199	1092
Salt Lake City, Utah.....	2486	1400
Denver, Colo.....	1951	1093
Pueblo, Colo.....	1970	973

The above table illustrates the nearness of Houston to the point of origin, and demonstrates the time and money saved in transporting goods for export to Houston, "the line of least resistance."

However, for incoming goods, either by import or from American seaboard points, the advantage in shipping to Houston, securing the water-rate competition, is demonstrated in a comparison of cost of shipping from Eastern points to the larger cities of Texas, which are used arbitrarily to distinguish the different sections of the State. The table follows:







BIRD'S-EYE VIEW

Houston Freight Rates Compared with Competitive Cities, Showing the Great Advantage of Houston as a Distributing Point.

	Class										
	1	2	3	4	5	A	B	C	D	E	
New York to Houston.....	92	73	60	51	40	45	40	33	32	32	
New York to Dallas and Fort Worth.....	172	145	120	109	84	91	80	67	55	49	
New York to Waco.....	159	135	116	105	78	84	76	63	53	48	
New York to Austin.....	153	120	111	100	75	81	73	61	52	48	
New York to San Antonio.....	164	139	119	108	80	86	78	65	54	49	
Seaboard Territory to Houston.....	107	85	70	60	48	53	48	41	40	40	
Seaboard to Dallas, Ft. Worth, Waco and San Antonio.....	172	145	120	109	84	91	80	67	55	49	
Seaboard to Austin.....	168	141	120	109	83	89	80	67	55	49	
Pittsburgh to Houston.....	141	116	94	76	..	..	..	..	..	..	
Pittsburgh to Dallas, Ft. Worth, Waco, Austin, San Antonio...	197	170	136	119	..	..	..	..	..	..	
Buffalo to Houston.....	135	110	92	74	..	..	..	..	..	..	
Buffalo to Dallas, Ft. Worth, Waco, Austin, San Antonio.....	197	170	136	119	..	..	..	..	..	..	

In addition to the class rates named in the foregoing table, there are a number of very low water rates to Houston on commodities shipped in carloads. The distributing rates from Houston and other points are the same for like distance. This gives Houston an advantage as a distributing point, consisting of the differences shown in inbound rates.

Keeping pace with the railroad facilities enjoyed, Houston is rapidly installing superb terminals, which investment is mounting into the millions of dollars. The Grand Central Station, the older station in Houston and one of the largest in the South, is utilized solely by the so-called Harriman roads and the Galveston, Houston & Henderson.

Two years ago the Houston Belt & Terminal Co. completed a magnificent three-story union station and extensive terminals, which represented an investment of approximately \$5,500,000. All other roads entering Houston, except the International & Great Northern Railway, now use this great station. Last year two stories were added to the station, supplying rooms for the general offices of the Terminal company and the railroads entering the station. This addition was but recently completed. Five stories in height and occupying an entire block, the Union Station is the second largest building in Texas and the largest and most modern passenger station in the South.

Plans have been completed and the contracts awarded for the construction of a passenger station in Houston for the Missouri, Kansas & Texas Railroad, which complete will represent an investment of about \$250,000. The new station will be erected on the site of the old Katy station, which was abandoned two years ago, following the opening of the new Union Station. The new Katy station will connect directly with the Main street viaduct, now under construction, and entry will be over the viaduct only. The main waiting-rooms will be on the viaduct level, while the trains will enter beneath the station and the viaduct. Electric escalators will convey passengers to and from the waiting-room level and the train level.

The Main street viaduct, which will cost approximately \$500,000, is nearing completion, and will be opened to traffic in March or April. It is a giant mass of concrete and steel, and connects the North and South ends of the city over Buffalo and White Oak bayous and the network of railroads in the Fifth Ward. It is 1600 feet in length. A single arch, bridging Buffalo Bayou, is 150 feet span, the largest concrete arch in Texas. It contains 50 tons of steel, and its total weight is 4,500,000 pounds. Six miles of piling are used in foundations for the giant structure.

The completed viaduct will bring into closer communication the north and south ends of the city, and will cause a continuation of Main street through the entire city. It will be paved with brick, and will be wide enough for two sets of tramway track, driveways on either side and sidewalk. Fire-fighting apparatus will be installed on the viaduct to fight fires on vessels beneath, while every few hundred feet little concrete towers are provided for the sale of newspapers, confections, and the like. Use of the viaduct will be free, as it is owned by the city. The viaduct was designed by Frank L. Dormant,

City Engineer, and represents one of the greater undertakings by the City of Houston.

The main street viaduct is but one of the greater building projects now under construction in Houston. Within the past three years the value of building operations in Houston can be conservatively put at \$25,000,000. The cost of building during the last year totals \$10,000,000 or more, and Houston led all other Texas cities in total cost of building operations for the year 1912. There is more building going on in Houston than in any city in the Southwest, and it is not probable any city in the land of equal population is matching Houston in this line.

For the year 1913 there is already in sight building construction that will total an investment of \$10,000,000 or more. There is hardly a block in the business section of the city that will not be improved in some manner. By the end of the year the downtown skyline will have undergone another change.

Improvements to be made are not confined to any one class or group. Railroads, public utility corporations, industrial concerns, private individuals, companies and the municipality are included among those who have made appropriations for important expenditures in permanent improvements.

In the \$10,000,000 estimate for the year of building already in sight there are not included the Main street viaduct, the \$2,500,000 ship channel improvement nor the four of the thirty-three proposed buildings of the academic group of Rice Institute which have been completed.

Prominent among the building construction to be started or completed during the year may be named the following: The \$3,000,000 eighteen-story Rice Hotel, the largest hotel in the South, now nearing completion; a ten-story general office building for The Texas Company; the Mason Building of ten stories, to rise on the site of the burned Mason Building at Main street and Rusk avenue; an eight or ten-story building to be erected by Levy Bros. on the burned site of the Levy Building at Main street and Capital avenue; an eight-story building for S. H. Kress & Co. at Main and Capital; the great addition to the Peden Iron & Steel Co.'s plant, for which a \$500,000 bond issue was made; the eleven-story Cotton Hotel, which was practically completed in February; a ten-story fireproof warehouse, the ten-story Stowers Building, and a score or more five and six-story buildings for which plans have been made, contracts awarded or building construction already under way. The Katy station will be one of the large items of this construction, while railroad improvements will mount into the hundreds of thousands.

The municipality of Houston will contribute to the year's building activity very materially. A total of \$3,500,000, recently supplied through bond issues, will be expended on the work for which the issues are intended started.

The incoming administration this year will have the task of directing the expenditure of these funds, which were voted for different amounts in several departments. One of the principal items will be installation of adequate drainage systems, for which \$750,000 is provided. A half-million is available for sanitary sewers, which will make possible the extension of sewerage to remote parts of the city.

For school purposes an even million dollars is available. Out of this fund two high schools are to be constructed and several ward schools. There is at present one high school in Houston, but the appropriation will make possible

VIEW OF HOUSTON.

the addition of a second to the South End facilities, and a high school to be constructed in the Fifth Ward, north of Buffalo Bayou.

For street-paving purposes there is \$300,000 available. A year ago Houston adopted the progressive front-foot paving plan, by which the property-owners pay for two-thirds of the cost of paving and the city one-third. When a steam or electric railway runs through the street to be improved, the railway company pays for all the paving between its tracks and one foot on either side of the tracks. In this case the total so paid is taken from the total cost of the paving and the balance divided into thirds between the abutting property-owners and the city.

The plan became popular from the start. Before that time all paving had been done by bond issues or out of the general revenues, and the city had attained the growth which prohibited further paving on that obsolete plan. Even before the frontal-foot plan was submitted at election, petitions under the new plan for paving were filed at the city hall. When the plan passed, these early petitions were the first acted upon, and today those streets are paved. In all there are about twenty miles of paving petitioned for under this plan, and the \$300,000 now available is for the payment of the city's one-third.

The public-park movement is being given great impetus in Houston. The sum of \$250,000 is available for park purposes, and this fund will be administered by a Park Board. A general city plan is now under consideration, and will be worked out under the appropriation now available. This plan includes the extension and improvement of the present parks, the purchase and improvement of additional land, the construction of boulevards and parkways and the construction of public playgrounds. The city is very wisely making this appropriation early in its history, when the ground necessary for the park and boulevard system may be purchased much cheaper than it can in a few years to come.

Another item in the bond issue was \$250,000 for bridges. This money will be expended in the construction of bridges over Buffalo and White Oak bayous, the streams that converge at Main street and divide the north and south ends of the city in half. The cost of the Main street viaduct is not included in the bond issue, that money being available only for the construction of bridges at the foot of each principal street abutting on the bayou.

A wonderful impetus to building operations is given by Houston's progressive tax system, which is modeled on the lines of the Somers' system. In 1911, before the Somers' system went into effect, the taxable valuation of Houston was \$77,294,351 and the tax rate \$1.70 on the \$100. The Somers' system was installed in November, 1911; the taxable valuation was raised to

\$96,275,850 and the tax rate reduced to \$1.50 on the \$100. Improvements were taxed at a lower figure than unimproved property, while all personal property in the hands of individuals was exempted from taxation. Land is assessed at 70 per cent. of its full value and improvements upon land at 25 per cent. of their value.

The effect was magical. In the first months of 1912 there were 219 more buildings erected than in the first six months of 1911, and the value of these buildings erected in 1912 amounted to three times the value of the buildings erected in 1911, which developed the fact that the partial exemption of improvements and personal property from taxation had the effect of stimulating

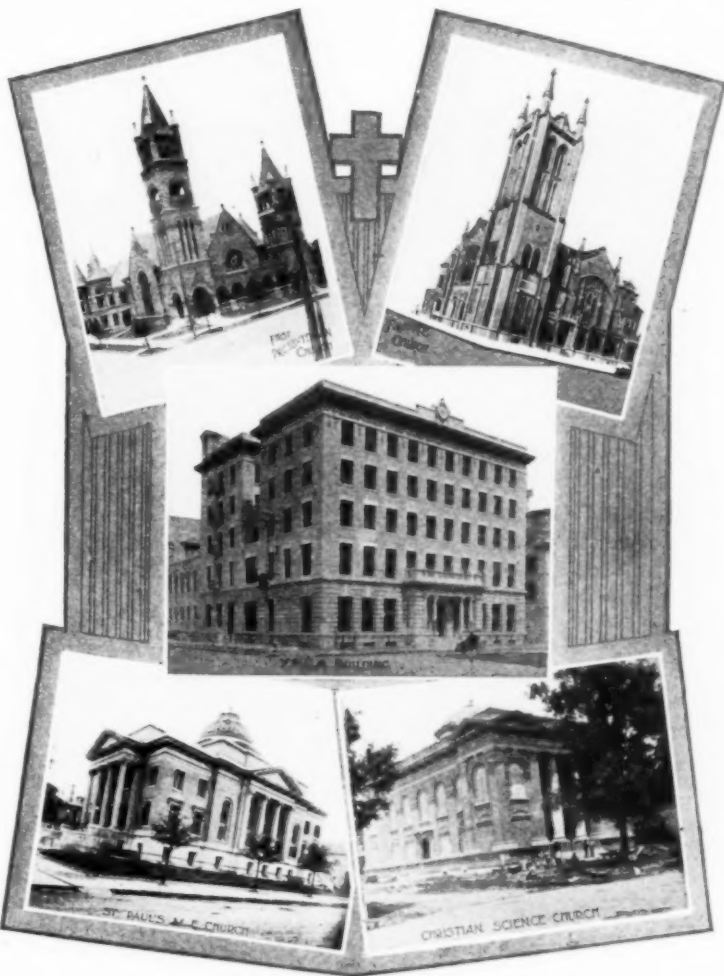
building industry. It also had the effect of increasing the number of land sales without depreciating the value of the land. Consequently, the assessing of land at 70 per cent. on the dollar of its full value and taxing it for city purposes at the rate of  $1\frac{1}{2}$  per cent. on the dollar, or \$15 on the \$1000 value, in addition to the State tax of \$8.60 per \$1000 valuation, will not affect the selling price of land, but will stimulate its sale at an advanced price. This makes a tax rate of 2.23 per cent. on a 70 per cent. valuation of land and a 25 per cent. valuation on improvements.

On the adoption of the new plan the assessment of land values in Houston were increased 25 per cent. over former assessments. At the beginning of 1912 land values were equalized, and all land was assessed at about 70 per cent. of its fair selling value, which in most cases was its speculative value. All personal property in the hands of individuals, such as money, cash in bank, stocks, bonds, mortgages, furniture and household goods, was totally exempted from taxes. Buildings and other improvements on land and machinery of manufacturers were assessed at 25 per cent. of their productive value. Franchises of public service corporations were assessed for the first time in Houston, the assessed value of the franchises of the various corporations amounting to \$1,799,900. A former charge for building permits was re-

pealed. In fact, there was more done to relieve industry from taxation in Houston in 1912 than has been done in any other city in the United States up to date.

Houston's tax system is but one of the various progressive ideas embodied in Houston's commission form of government, which is without exception the most successful form of charter government in any of the several cities now governed under the commission plan.

Houston was the second city to relegate the old aldermanic mode of government and adopt the commission form. The Houston charter was modeled somewhat on the lines of that of Galveston, but generally improved to fit



HOUSTON IS NOTED FOR BEAUTIFUL CHURCHES.





STOWER'S BUILDING



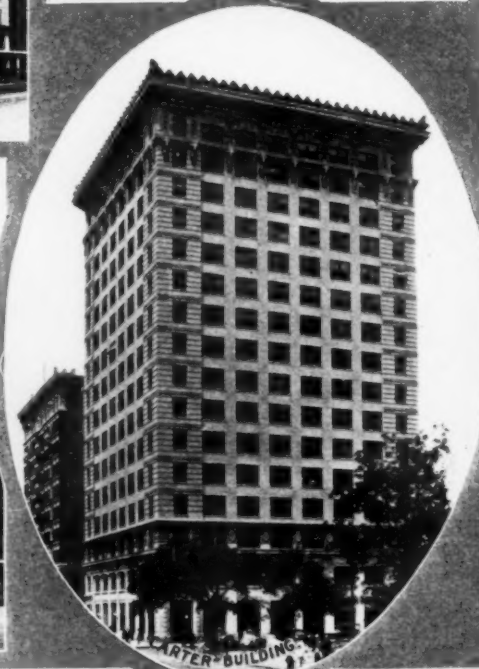
SOUTHERN PACIFIC BUILDING



HOUSTON CHRONICLE



STEWART BUILDING



CARTER BUILDING



TELEPHONE BUILDING



SCANLAN BUILDING



PAUL BUILDING

conditions of a larger city. It was adopted and put into effect in 1905, a Mayor and four Commissioners being elected from the city at large. Wards were abolished, and with them went ward politics. Commissioners so elected represented the city at large, and their interests were not confined to any one particular section of the city.

Under charter form Houston's municipal affairs are in the hands of a commission, operating under a charter from the State Legislature and conducted in the same way that a great corporation manages its affairs.

When the commission took charge in July, 1905, it took over a \$400,000 deficit. The city practically had no credit, and its finances were demoralized. Now seven years of commission government have vindicated the economies and progress of the new form. The city administration is on a business basis, and the people of Greater Houston are working hand in hand for a greater metropolis.

The executive power is vested in the Mayor, but by an ordinance for the administration of the city's affairs a large portion of executive or administrative power is subdivided into different departments, and a committee is placed over each department, and one of the four commissioners nominated by the Mayor is known as the active chairman. The Mayor and four commissioners are members of all committees.

An executive session is held previous to each meeting of the City Council, at which most matters to come before the Council are discussed and determined. Again, the small number of aldermen enables the city administration, on any and all matters of importance, to act as a unit. In other words, the system makes it possible to administer the affairs of the city in a prompt and businesslike way.

The commission government has obliterated politics from the public schools. The School Board is nominated by the Mayor and confirmed by the Council. They, in turn, elect a School Superintendent. The teachers are selected for their fitness. No commissioner can even suggest the name of a teacher to the Board.

Another very important departure in the Houston charter is in the matter of municipal franchises. No franchise can be granted for a period longer than thirty years, unless it is submitted to a vote of the legally-qualified voters of the City of Houston and approved by them. The expense of this election must be borne by the person or interest applying for the franchise. The charter reserves the right in the City of Houston to regulate the rates of all public service corporations.

There is also included in the charter what is known as the referendum. That is, if 500 qualified voters of the city petition the Council to call an e-



HOTEL BENDER



RICE HOTEL.



COTTON HOTEL.



BEACONFIELD APARTMENTS



ROSSIONIAN APARTMENTS

SOME OF HOUSTON'S  
SPLENDID HOTELS AND APARTMENTS.

tion to determine the granting of any particular franchise, it is incumbent upon the Council to do so.

In the operation of the commission form many extensive improvements were made. The city water-works system was purchased and is now conducted by the municipality, while the plant has been greatly improved and enlarged and the service extended.

A floating debt of \$400,000, prevailing at the time commission government was installed, was wiped out, and by the strictest economy in the first eight months of commission government \$306,202.47 of the old floating debt was redeemed. In five years the entire debt was taken up and improvements to the value of \$1,865,757.17 were made and \$313,828.70 in Storrie and refund paying certificates and sinking fund were absorbed without the issue of a single bond.

The organization of the city administration may be likened to that of a great corporation. The assessed valuation may be known as the capital stock of this municipal corporation, the Mayor its president and its four commissioners as the board of directors. All other employees are as responsible to the Mayor and commissioners as the employees of any corporation are responsible to the heads of their departments and in turn to the president and board of directors.

In short, the transition of the Houston municipal government was from the old form of political patronage, bickering and machine rule to that of a well-regulated business corporation, administering the affairs of the city in a businesslike way and promoting the interests and enlarging the city as a corporation promotes the interests of its own business.

In 1905, when commission government went into effect, the population of Houston was about 65,000. Today Houston, with its suburbs, which are divided from the city only by an imaginary city limits line, and are likely to be

taken in before the next census, has a population in excess of 125,000. In 1905 the assessed valuation of the City of Houston was \$37,000,000. Today it is \$96,275,850.

In commerce and industry Houston shows some other startling figures in growth. Thirty years ago the lumber industry practically was not represented in Houston. Today Houston is the lumber market of the Southwest and not excelled by any city in the South. Annual lumber sales in Houston total nearly \$40,000,000. Houston is the center of the great pine and hardwood forests of Texas and shipments by rail are made to all parts of the continent and for export via the Ship Channel. Forty-eight corporations, with a combined capital of \$78,000,000, engaged in the wholesale lumber trade, domicile in Houston.

As a factor in the marketing of cotton Houston is a power. It is the largest inland port cotton market in the world and handles two and a half million bales annually. The largest compresses and oil mills in the South are located here, and the item of cotton alone transported over the Ship Channel totaled \$23,340,000 for the past year.

Houston is the headquarters for Texas petroleum, being in the center of the great producing fields of Texas, the annual production of which is about 13,000,000 barrels. Pipe lines to Texas and Oklahoma fields bring the product to this city.

As a great rice market Houston is the largest primary rice market in the South. Seven modern rice mills are located here, and the value of the annual product is over \$6,000,000.

Houston is the manufacturing and industrial center of Texas, 347 factories turning out 282 different articles to an amount of about \$51,000,000 annually, the annual wage earnings in these factories being in excess of \$10,000,000.

Houston is the financial strength of the Southwest, its banking power and





RICE INSTITUTE.

Opened October, 1912. This picture was taken the day of dedication and shows some of the buildings so far constructed of the proposed academic group of 33 buildings.

resources leading all cities in the Southwest and more than several of them combined. The total national bank deposits aggregate \$41,206,315. There are six national banks with combined capital and surplus of \$7,900,487, one bank having a capital of \$2,000,000 and two others a capital of \$1,000,000 each; six trust companies having combined capital and surplus of \$6,484,815, and one State bank capital and surplus of \$22,192, the total capital and surplus of these institutions being \$14,407,494.

fifth building for the physics department will be constructed this year, and the other buildings will be added as the needs demand.

The initial teaching staff of the Institute is organized for university and college work into a faculty of science and a faculty of letters. In the former of these faculties are representatives of a school of pure and applied science of the highest grade. With a view to liberalizing all technical courses of the curriculum, there will be constituted as rapidly as possible a faculty of letters,

**LATEST HOUSTON BANK AND TRUST COMPANY REPORTS. NATIONAL BANK STATEMENTS  
TAKEN FROM REPORTS TO THE COMPTROLLER OF THE CURRENCY AT THE  
CLOSE OF BUSINESS, FEBRUARY 4, 1913.**

**National Banks.**

	Capital.	Surplus and Undivided Profits.	Deposits.	Total Resources.
First National.....	\$2,000,000	\$290,724	\$10,730,896	\$15,025,120
Union National.....	1,000,000	373,510	9,249,781	10,863,630
So. Texas Com. National.....	1,000,000	976,237	10,832,729	14,184,913
Houston National Exchange.....	200,000	239,254	4,174,908	4,809,160
Lumberman's National.....	600,000	409,402	3,948,875	5,358,992
National Bank of Commerce.....	500,000	11,360	2,269,126	3,272,087
	<b>\$5,300,000</b>	<b>\$2,600,487</b>	<b>\$41,206,315</b>	<b>\$53,513,902</b>

**Trust Companies.**

	Capital.	Surplus and Undivided Profits.	Total Resources.
Bankers' Trust Co.....	\$2,000,000	\$932,553	\$2,932,553
Security Trust Co.....	250,000	.....	250,000
Commonwealth Trust.....	200,000	1,954	201,954
Continental Trust.....	200,000	834,019	1,034,019
Houston Land & Trust.....	250,000	368,389	618,389
Southern Trust Co.....	800,000	647,900	1,447,900
	<b>\$3,700,000</b>	<b>\$2,784,815</b>	<b>\$6,484,815</b>

**State Banks.**

	Capital.	Surplus and Undivided Profits.	Deposits.	Total Resources.
Guaranty State.....	\$20,000	\$2,192	\$129,797	\$152,347

The power and strength of Houston's financial prestige is also reflected in the many magnificent banking structures in Houston's "Wall Street" or financial section.

Houston is the center of the winter truck-growing section of the South. Products are grown and marketed the year 'round without irrigation, as the coast country is the rain belt of Texas. The country around this city is the natural home of the planter, farmer, dairyman, truck and fruit grower. Houston is the market, for the products of the soil in the section and the annual business of "Produce Row" will aggregate \$5,000,000.

As an educational center this city sprang into world prominence over night. There was opened here last fall the great Rice Institute, founded and endowed by the late William Marsh Rice, and dedicated by him to the advancement of letters, science and art. The endowment of the Institute now reaches \$10,000,000, and it is the seventh richest college in the United States. It is co-educational.

The Institute opened with probably the greatest academic "show" ever staged. Learned professors and scientists and school dignitaries from all over the world attended the inaugural and delivered lectures in their native tongues. It was a most impressive dedication of one of the great colleges of the land, and at once pushed Houston to the forefront as destined to be one of the great educational centers of the United States.

The tract of land on which the Institute is located measures about 300 acres. It is situated on the extension of Main street, three miles from the center of the city. The academic plan contemplates the erection of 33 or more buildings, Greek playhouse, athletic fields, boulevards, campus and courts. When the Institute opened four buildings were completed—the administration building, the engineering building and two residential halls. A

in which will be developed incidentally fine facilities for elementary and advanced courses in the so-called humanities, thereby enabling the Institute to offer both the advantages of a liberal general education and those of special and professional training. The courses of instruction and investigation are open to young men and to young women. There is no charge for tuition; rooms in the residential halls and board at the commons is furnished at the actual cost of maintenance and provision. Further, for a limited number of meritorious students of promise undergraduate scholarships and graduate fellowships will be available.

This year and next many conventions—state, national and international—will hold annual and bi-annual conventions in Houston. They are attracted to the Texas metropolis by its superb hotel advantages and its great Municipal Auditorium, which seats 7000 persons. Houston offers the convention delegate the largest modern hotel facilities of any city in the South, any three of the five or six great hotels being capable of caring for the average convention. An idea of the magnitude of Houston's hotel facilities may be gained by a comparison with New Orleans, Houston having 200 more first-class hotel rooms than her Louisiana sister city.

The Auditorium was opened about two years ago, and in that time has more than proved its worth. It is absolutely fireproof, being built of concrete, steel, brick and stone. It cost the city \$400,000 and was paid for out of the general revenues without the issue of a single bond. The construction is a departure in auditorium building, the great arena affording a full view of the stage from any direction. There is not a pillar or post in the arena, the roof being swung by steel beams similar to bridge construction.

A grand banquet hall occupies the only second floor room, being directly above the opening foyer or grand entrance and adjoins the arena on one side.

This hall, although intended primarily for banquets, is oftentimes used for the smaller conventions and meetings, as it will accommodate a thousand diners or fifteen hundred or more persons seated facing the stage.

With ample hotel and convention hall facilities, Houston is well prepared and equipped to handle any ordinary convention. In entertainment the Houston district and the coast country offers varied pleasures the year 'round.

limits, and its membership is large and representative of Houston's social and business interests. The only 18-hole golf course in Texas is maintained at the Houston Country Club.

There are several other clubs in Houston, handsomely and comfortably appointed, which are open to convention delegates and visitors.

The stranger in Houston rarely misses the opportunity to view the San



FIRST NATIONAL BANK BUILDING.



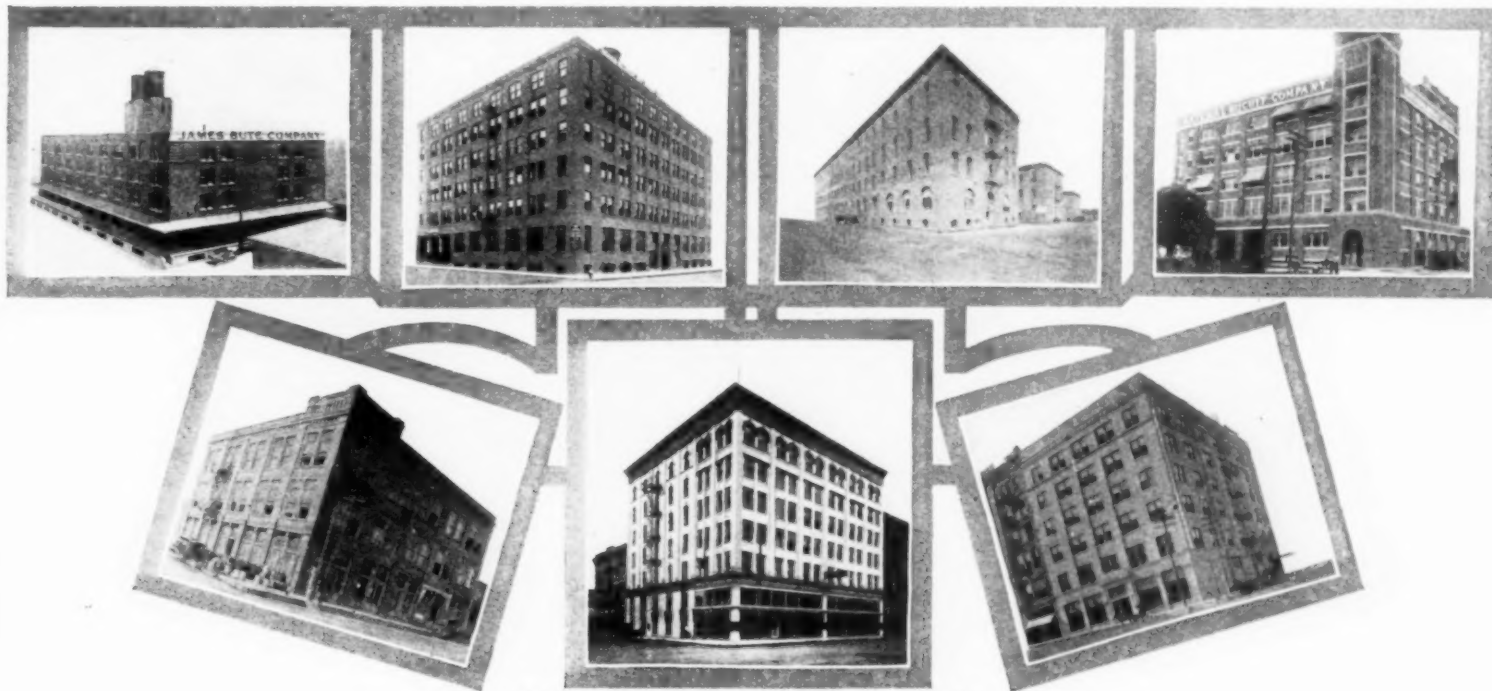
UNION NATIONAL BANK BUILDING

Deep sea bathing, deep sea fishing, hunting for anything from a snipe to a bear or deer, and tours over the historic spots of Texas, are available for the delegate.

Harris county, of which Houston is the capital, has 300 miles or more of magnificent paved country highways, all radiating at Houston, which make automobiling one of the most pleasant forms of entertainment. There are nearly 3500 automobiles in Houston. A million-dollar bond issue to extend the county good roads and build bridges has just been voted by the county.

Jacinto battlefield, fifteen miles below the city, on the Ship Channel. There, April 21, 1836, General Sam Houston defeated the trebly greater Mexican forces under command of General Santa Anna and won Texas independence from Mexico. The battlefield is now owned and maintained by the State as a public park. It is reached by boat or automobile, and is always included in the entertainment of convention delegates.

Some startling surprises are in store for the visitor in Houston. Even the Houstonian absent for a year will find on return a different skyline and a



SOME SPECIMENS OF COMMERCIAL BUILDINGS.

The Ship Channel and the bays afford unlimited pleasures in boating, and over 300 pleasure boats, from little "one-lungers" to palatial ocean-going yachts, berth in the channel around the wharves of the Houston Launch Club. An annual regatta is held by the club, which attracts speed boats from all along the Atlantic and Gulf seaboard.

The Houston Country Club is located about three miles east of the city

changed complexion. Houston has all the earmarks of a modern city and is fairly bounding ahead. The tall, graceful skyscrapers prominent in the business section are transforming its skyline into a picture reminding one somewhat of New York, and they are towering monuments to the resources and enterprise of the people who are making this city a great metropolis and a soon-to-come world seaport.



# How John H. Kirby of Texas Grasped the Opportunities Presented by the Asset in The South's Timber

*"In the history of the Kirby Lumber Co. and its leading spirits there is an inspiring example for Southern young men, wherever they may be."*



**OPPORTUNITY**, apostrophized by Ingalls, never knocked louder than at the door of the young man of the South, and where he has been heard a right great have been the rewards bestowed.

John H. Kirby as a young man rightly appraised the wealth in the expansive forests of yellow pine his native region of East Texas contained. He had the vision to see and the energy to achieve at a time when the development work was in a pioneer stage. Overcoming obstacles of varied kinds and often appalling magnitude, he wrought out the enormous Kirby Lumber Co. operations of today, with its fourteen mills, 6000 employees, \$1,000,000 annual payroll and capacity of 500,000,000 board feet of lumber a year—nearly 1,400,000 feet per day.

With his family impoverished by the war, Kirby's early opportunities were as restricted as those of any other Southern farmer boy, but he always worked, and he always had his eyes open, and today, at fifty-two, he heads one of the greatest development enterprises in the South, and has been for years one of the foremost figures in industrial, financial and commercial affairs in the Southwest. He is essentially a Southern product, and his success has been achieved solely by the utilization of Southern resources.

The magnitude of the Kirby Lumber Co.'s operations is not easily conceivable by the layman mind. In addition to the 500,000,000 feet of lumber annually sawed, there are 2,500,000 hewn ties cut and 50,000 sticks of piling gotten out. There are 300 cars of logs cut daily at the mills. The number of cars of lumber and sawn timber shipped annually is 22,000; cars of hewn ties, 7000; cars of piling, 1200. The company has 8,000,000,000 feet of timber under contract and yet to be cut. To gain some idea of the annual output of the company, it may be computed that, as a board one inch thick and twelve inches wide, it would be approximately one hundred thousand miles in length, while the tie and timber department could furnish in addition ties, piling and timbers enough to fully equip a railroad one thousand miles long.

The company owns and operates two hundred and twenty-five miles of railroad of its own, and has seventy-five locomotives and seven hundred and fifty logging cars and miscellaneous equipment.

Thirty traveling salesmen are employed, and outside of the home offices, at Houston, there are eight branch offices, located at Chicago, St. Louis, Omaha, Kansas City, Oklahoma City, Waco, San Antonio and Havana, Cuba.

The product is marketed throughout the country, from Maine to New Mexico, principally in the Mississippi Valley, in addition to which domestic market shipments are made to the West Indies and to European ports. About 30 per cent. of the output moves by water through Gulf ports, chiefly through Port Bolivar. The various steamship companies have a sailing each day out of Gulf ports for New York, and lumber and timber can be delivered on the New York docks in ten days from the sawmill.

Twenty per cent. of the output goes to the railroads, which almost ex-

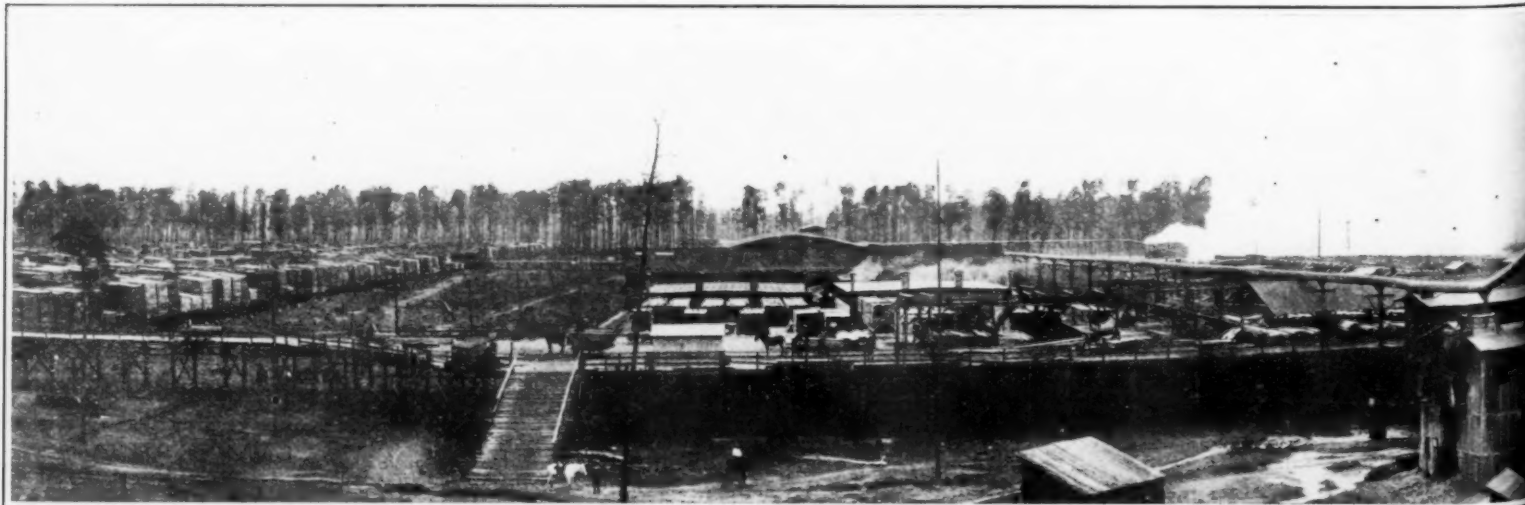
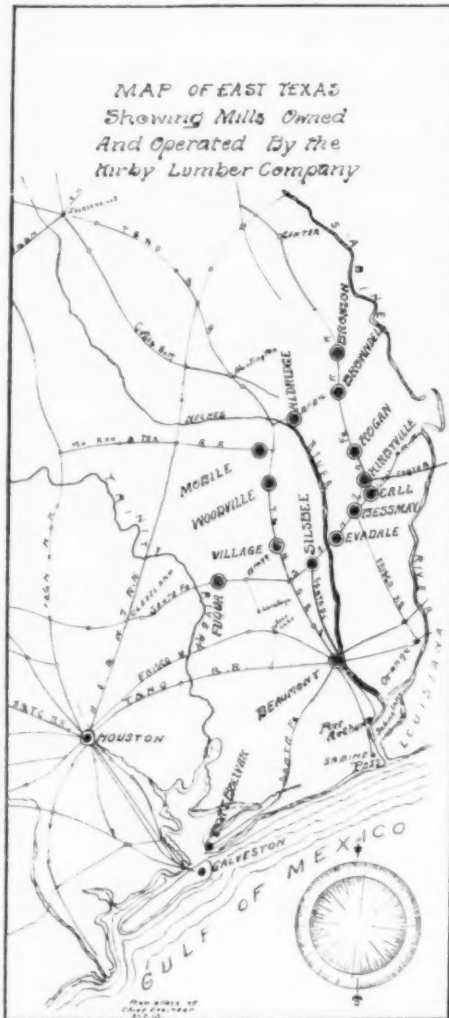
clusively use yellow pine for wooden construction. Ninety per cent. of the lumber used for general structural purposes in the Mississippi Valley is yellow pine.

The present enormous yellow pine industry of East Texas and West Louisiana is a development of comparatively recent years, as is evidenced by the fact that, while the lumber sales at Houston now amount to \$40,000,000 a year, in 1880 there were none.

In this development John H. Kirby played a leading part, and it is one of the significant features of the situation that he found "acres of diamonds" at his home place, instead of wandering afield in search of opportunities to fit his ambitions and his energy. John H. Kirby would undoubtedly have succeeded anywhere, but by utilizing Southern opportunities and those right at hand, he became an inspiration to others in the field, assisted largely in bringing prosperity to a vast section and achieved a success notable among successes anywhere. It was not necessary for him to leave home, as it need not have been in the case of thousands of other ambitious and energetic young men who went out of the South previous to 1890 on the theory that only in the North and West were there to be found alluring avenues to wealth and achievement. It is impossible to compute the loss to the South in this migration of her ambitious and energetic young men, just as it is impossible to estimate the benefits that have come from such an example as that of John H. Kirby in remaining at home and doing big things here. The men he has gathered about him are largely native Texans, and men of the South, and not only has the whole State been benefited by the development of a great industry, but towns and cities have come into being and received a great impetus in growth through the lumber industry.

Previous to 1890 Houston was in no sense a lumber trade center. That year John H. Kirby took up his residence here, and made it his headquarters. Being by that time conspicuous as a lumberman, on account of the big way in which he carried on his operations, other lumbermen followed his example, until Houston has become the great lumber center of the Southwest, the headquarters of all but two or three of the forty-eight large companies operating in East Texas and West Louisiana. The centralizing of the lumber business in Houston aided powerfully in stimulating the growth of the city and in transforming it within the past few years from a six-story town to a sixteen-story city, the financial center and commercial metropolis of the Southwest.

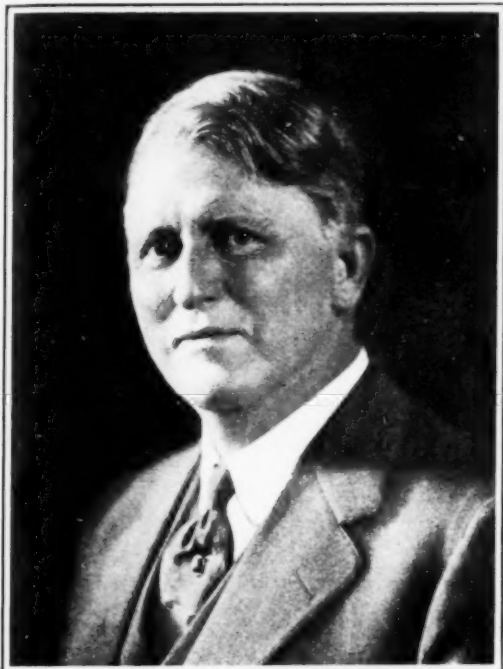
Born on a farm in Tyler county, Texas, in 1860, Kirby worked on the farm until he was nineteen, meanwhile availing himself of such schooling as he could command. Then he was Deputy Tax Collector, and for three terms was Clerk of the State Senate. After his majority he turned to the law, being admitted to the bar at the age of twenty-five. He had specialized on real-estate law, and in 1886 he was given a case wherein there was a controversy affecting the interests of some Eastern investors in Texas timber lands. Being signally successful in establishing the rights of his clients and gaining an insight into the possibilities of timber



KIRBY LUMBER COMPANY'S

MILL R. I

operations, he was listened to when he laid before the Boston capitalists a proposition for the utilization of the vast wealth he perceived the yellow pine forests contained. His presentation of the case was so wholly convincing that he was authorized to purchase a large tract of timber and manage timber operations on a percentage of profit. Being successful from the start, more funds were provided, and within a few months the Texas and Louisiana Land & Lumber Co. was created with an ownership of 100,000 acres of yellow pine land. Twelve or fifteen other corporations and partnerships were formed during the next few years, and in 1901, with 600,000 acres of land, they formed the basis of the Kirby Lumber Co., John H. Kirby, president, which was char-



JOHN H. KIRBY, President.

tered under the laws of Texas, with \$10,000,000 capital, \$5,000,000 of which is 7 per cent. cumulative preferred and \$5,000,000 common.

At the same time, the Houston Oil Co. was organized with \$30,000,000 capital. This company took over a portion of the 600,000 acres of lands represented by the various companies forming the Kirby Lumber Co., and with additional acreages acquired by purchase, now own about 800,000 acres. The Houston Oil Co. then entered into a selling arrangement for timber with the Kirby Lumber Co.

Subsequently, the construction of a contract involved the companies in litigation,

but although receivership proceedings were resorted to in one instance, the affairs of the companies were finally entirely straightened out, and are on the most sound, substantial and satisfactory basis at the present time. It is indicative of the principles and methods of Mr. Kirby that he backed with his private fortune the operations of every company he controlled, and that on reorganization every just claim was paid, even if not legally binding.

Another interesting sidelight on the methods and character of the Kirby organization is shown in the treatment accorded their men during the panic of 1907. With 6000 employees there is an army of some 35,000 people dependent on the Kirby payroll. For some weeks following the fateful October day in 1907 when the bankers locked up their cash boxes, money for payrolls was not to be had in many quarters of the land. Until normal conditions were restored the Kirby employes were given rent free, free doctors' bills and medicine and full credit for groceries, supplies, and so forth.

The mills of the company are located at Beaumont, Silsbee, Evadale, Bessmay, Call, Woodville, Aldridge, Kirbyville, Mobile, Roganville, Brownadel, Bronson, Fuqua and Village Mills. Some of these smaller sawmill towns will develop into villages and cities of consequence, as plans are being worked out by the Houston Oil Co. to secure settlers for the cut-over lands which are accumulating at about the rate of 30,000 acres a year. It is planned to do the work of settling in a scientific manner, with demonstration farms to show settlers proper crops and methods adapted to the soil.

Reforestation has been approved of, and to an extent it is possible to secure a second growth of valuable timber after a lapse of twenty years or so. There is a life of at least twenty-five years in the stumpage owned and controlled by the Kirby Lumber Co., but long-leaf yellow pine does not reproduce in

a commercial way, and doubtless the larger portion of the lands when cut-over will be in line for ultimate cultivation. The East Texas lands are adapted to a great variety of products. In many places peaches of the finest flavor and marketing qualities are already being raised, and tomatoes, potatoes and other truck, as well as the staple crops, thrive famously. The proximity of these lands to the large markets suggest their inevitable utilization for intensive farming purposes and fruit-growing, and in the course of time all East Texas should be a thickly populated and most prosperous section. After having yielded its timber crop of millions on millions, it should for all time yield its millions on millions of annual returns in fruit, produce, cotton, live-stock, etc. With something like a million acres to operate with, the project of peopling and cultivating this vast tract assumes the proportions of true empire-building.

The exigencies of timber operations required more adequate transportation facilities than existing roads could afford, so in 1893 Mr. Kirby began the construction of the Gulf, Beaumont & Kansas City Railroad, which he finished from Beaumont to a point in the pine forests seventy-five miles to the north, and then sold the road to the Santa Fe System. It has since been extended to Center, one hundred and forty miles to the north of Beaumont to a junction with the Houston, East and West Texas line of the Southern Pacific System. Tap roads and other roads have also been constructed into the long-leaf pine belt, so that when the timber is cut off there will be a variety of interests to be benefited by the settlement and cultivation of the cut-over lands.

This gives a glimpse—but nothing more than a glimpse—of the great scope and importance of development work originated by one young Texan who had the vision to see and the energy to work. The beneficence of that initiative will endure for all time.

Outside of these operations, time-consuming and absorbing as they are, Mr. Kirby is interested in banking, real estate and other operations in Houston, and is always identified with public enterprises of an important sort. Just now he is serving as a member of the State Legislature, and if he listens to the friends who got him to make that race, he may be found in the Governor's chair or in the halls of Congress. As may be assumed from the record of his achievements, Mr. Kirby has a well-balanced mind and a comprehensive grasp of conditions generally. Thus he is not given to isms or vagaries, but is broadly conservative, rational and sound. He "saws wood," and has small patience with the fellow whose only vocation is to sit on the fence and tell other people how wood ought to be sawed.

In achieving his successes in a big industrial and financial way, Mr. Kirby has been staunchly supported and ably aided by the corps of assistants he has attracted to him, and especially has he been immeasurably assisted by Mr. B. F. Bonner, since 1903 vice-president and general manager of the Kirby Lumber Co. Frank Bonner, as he is known to his familiars, is also a native Texan, his birthplace being in Angelina county. He has long been identified with the Kirby interests, and he worked his way to the top from a subordinate position by also having the ability to see and think and the energy to work.



B. F. BONNER, Vice President.



MILL R. BESSMAY, TEX.



# A New Port Which Is a Free Port

## Now Being Developed By the Foremost Capitalists of America



Establishing the new gulf port of Freeport, at the mouth of the Brazos River, in Texas, by a financially-strong syndicate of New Yorkers in the latter part of 1912, a move of such notable interest and significance was made as to attract nation-wide attention and comment. Men of millions, acting in their individual capacity, under the leadership of E. P. Swenson, a native Texan, but long engaged in banking in New York City, formally opened Freeport November 20 in the presence of the Governor of Texas and distinguished citizens of that State, along with noted visitors from New York, Chicago, St. Louis and elsewhere, and a new seaport, industrial and commercial city was started on a career of manifest great importance.

Conspicuous in that it is the only port in the country where there are to be no wharfage charges of any kind, now or ever, Freeport also is unique in being located on a land-locked harbor, and yet within a short distance of the open sea. In this harbor vessels rode in safety during the Galveston storm. It has the distinction of being the only real free port in the country, while at the same time being closer to deep water than any on the Gulf.

With ample capital behind the enterprise, and with enthusiastic faith in its future by those who are backing it, Freeport's development as a really great center of commerce and industry is believed to be a matter of only a short time. The company owns 10,000 acres of land, which will be utilized for townsite, factory locations, railway terminals, wharves, etc., as rapidly as demanded. The initial development includes paved streets, concrete sidewalks, water-works, company hotel of spacious size and handsome design, railroad and steamship service, fuel-oil tank storage, with other improvements to come along as occasion arises. Hundreds of town lots have been sold to individuals—not more than four to each purchaser—and a number of stores and residences are completed or under way.

Freeport has been given immediate standing as an industrial town by the development of a sulphur deposit on Bryan Heights, two miles southwest from the townsite. Exhaustive tests have demonstrated that here is a deposit larger than known elsewhere—17,000,000 tons is regarded as a conservative estimate—and the operation of these mines means the continued

supremacy of the South for years to come in the sulphur markets of the world.

In addition to this initial industry, which began operations in a preliminary way two days before the formal opening of the townsite, negotiations are well advanced for the establishment of a sugar refinery at Freeport with a capacity of 2000 to 2500 barrels a day. It would give employment to some 500 hands, and would of itself create a population of 2000 to 4000 people.

Freeport will be an oil-distributing center, through connections with the enormous fields of Tampico, Mexico. Fuel oil will thus be a basis for a varied industrial development here.

The Panama Canal will create the opportunity here for a great lumber market. Supplies will ultimately be drawn to Texas ports from the Oregon and Washington forests, and from those of Central and South America.

Facilities for assembling and distribution will make possible the development of a great iron and steel trade.

Hereabouts is a paradise for sportsmen with rod and gun. A new and well-appointed hotel, the Tarpon Inn, provides comfort for the visitor. The surf bathing is unexcelled, the climate is alluring, and stretches of beach and improved roads make possible the establishment of Freeport as a leg in automobile runs between Galveston, 40 miles away; Houston from Galveston, 50 miles, and Houston to Freeport, 60 miles. Also, it is proposed to extend the good-roads development so that Freeport and San Antonio will be linked up.

Of first importance in considering the possibilities of development here is the personnel of the syndicate having the work in hand. The individuals who have undertaken the development of the Freeport townsite, terminals and sulphur are men of first importance in the financial world. While some of these men are interested in the great financial institutions of the country, it is worth noting that it is as individuals they are in the field. It is their own personal money which they are placing, and the banks whose affairs they administer are not concerned. These men rarely make mistakes; the list includes men who have done things; they believe in great things for Freeport, and are financially able to carry out any plans they conceive for its benefit. Among these are Frank A. Vanderlip, banker; James Stillman, banker; S. M. Swenson & Sons,

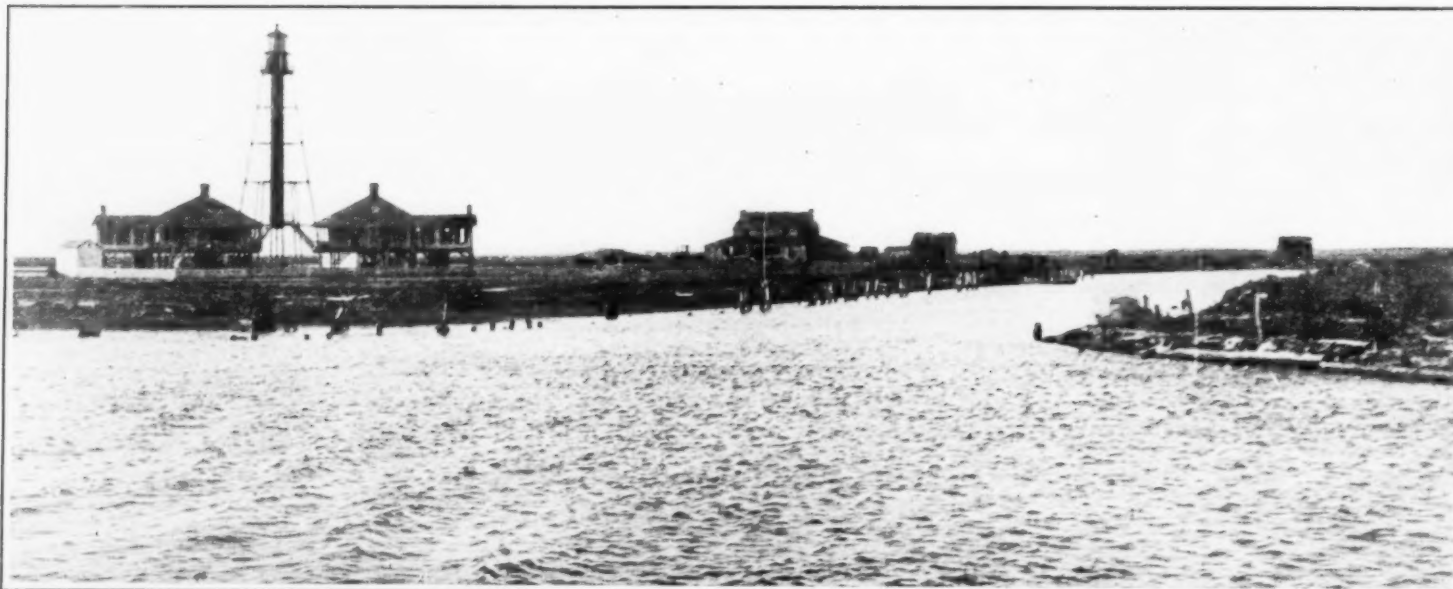


WHAT THE MAP SHOWS.

Freeport is situated at the outlet of a gigantic funnel through which a vast volume of commerce is destined to flow. The mouth of this imaginary funnel rests in the center of the United States and extends downward through highly productive wheat, corn, beet sugar and cotton producing lands through which it is possible to divert a large percentage of these agricultural products to the coast of Texas, from whence overseas distribution can be made to the people of all countries of the world. Freeport will be a great outlet for this trade.

Freeport is 510 miles nearer Panama than New York, and is the nearest deep-water seaport in the United States to the canal, through which such a large proportion of the world's commerce is destined to flow.

Freeport is 780 miles from the center of the very heart of agricultural continental U. S. A. It is 555 miles nearer that section than New York and 510 miles nearer than San Francisco.



JUNCTION OF THE INTERCOASTAL CANAL, RUNNING EAST TO GALVESTON, AND THE BRAZOS RIVER.

This section is now open for navigation and in use. The distance between Galveston and Freeport is approximately 40 miles. Brazos light is shown on the left.

bankers; F. B. & S. Tilghman, bankers; Samuel McRoberts, banker; F. Q. Brown of Redmond & Co., bankers; estate of Edwin Hawley; M. Orme Wilson and James M. Edwards of R. T. Wilson & Co.; E. M. Carter, banker; C. Sidney Shepard, banker; Williams & Peters, bankers, all of New York; John L. Williams & Sons, Richmond, Va.; John Hays Hammond, the world's most famous mining engineer; A. Chester Beatty, mining engineer.

A number of the members of the syndicate attended the formal opening of the townsite November 20, at which there were some 1500 people present.

Although the sulphur plant, with its tons of pure sulphur on the dump, was the most spectacular and generally visited feature of the development here, the first industry to gain foothold at Freeport was the Freeport & Mexican Fuel Oil Co., owners and operators in the oil fields in the Tampico district, and the importance of the operations of the oil company was impressed on all. The holdings of the Freeport & Mexican Fuel Oil Co. are so near the Gulf coast that the oil flows by gravity into the tanks of its line of tank steamers, plying between Freeport and the oil field, so that the cost of loading vessels is represented merely in the opening of a valve. Steaming across the Gulf, its capacious storage tanks on the Brazos' banks at Freeport receive the oil pumped direct from the vessel. The refining of oils at Freeport is a natural consequence, as a market for all oil by-products lies within easy reach from this port, while as a distributing center for fuel oil its location is ideal.

The industry of the greatest immediate importance to Freeport, of course, and the one which will yield large tonnage at its start, is the sulphur field at Bryan Heights. These operations are controlled by the owners of the Freeport townsite. The process of recovery is familiar to those acquainted with the methods used in the Louisiana fields. The sulphur is liquefied by the injection of superheated water. The liquid sulphur is then pumped by an air lift to the surface and conducted to points of accumulation, where it hardens on cooling and is ready for shipment, being practically pure, and requires no refining. The initial plant is now completed, and the first flow of sulphur began November 18. The Louisiana sulphur field has been the only important American supply, and the world-wide demand will require all that both can produce.

One of the main features of all Southern ports is the exportation of cotton in the bale, and Freeport will be a favorable port and take its share of this enormous tonnage. It will require additional railroads, adequate warehouses and handling facilities, and these will become a part of the development.

Sites for warehouses, with excellent terminal grounds, will be donated to such institutions as can show that their business and tonnage entitle them to such concessions. Thus owning their own front on deep water, they can erect and equip such special docks as are needed for their particular business, with ample warehouse and terminal area, and be free from all dock and wharfage charges forever. This liberal attitude of the owners will undoubtedly

bring many manufacturers and heavy shippers to Freeport. Transportation facilities include railroads, steamship and, shortly to be completed, the Intercoastal Canal. The Freeport syndicate has acquired a controlling interest in the Houston & Brazos Valley Railroad, connecting at Anchor with the International & Great Northern, and at Angelton with the St. Louis, Brownsville & Mexico. This road now terminates at Velasco, on the opposite side of the river, and cars are ferried into Freeport. Plans include the bridging of the Brazos and extension to Freeport as the terminal.

The Seaboard & Gulf Steamship Co. is already a steamship line from its docks opposite Freeport to New York. The inauguration of adequate passenger and freight service between Freeport and the eastern seaboard will be one of the first problems for consideration. There are now freight offerings far in excess of capacity of the existing line.

The Intercoastal Canal connecting Galveston with the mouth of the Brazos is completed, while the section from the Brazos to Matagorda Bay is about half done, with work actively progressing. This great inland waterway for barges and similar craft will be a strong feature in the development of the coast country.

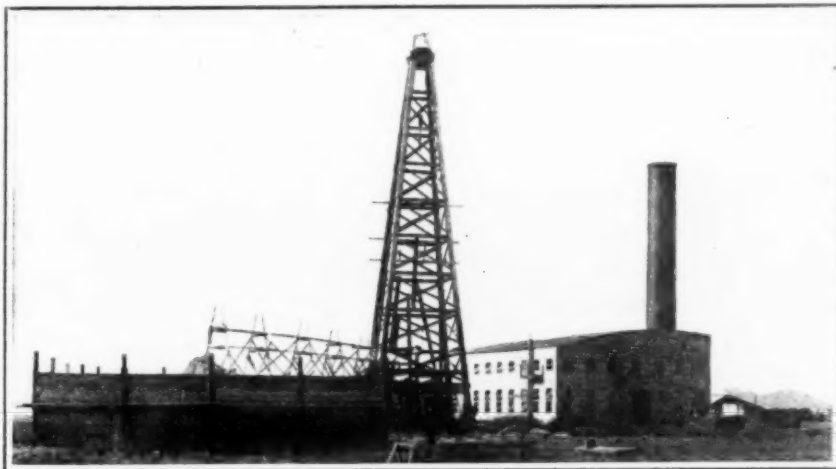
Of incidental but highly important relation to the development of a great port at the mouth of the Brazos is the fact that the Brazos Valley and other rivers and creeks in the neighborhood are of wonderful richness. The alluvial deposits of untold ages have accumulated there, giving a depth and richness of soil unsurpassed anywhere, and upon which crops of great variety are grown, and for cotton, corn, sugar-cane, rice, vegetables and fruit it cannot be equaled.

The physical work of developing a commercial port at Freeport is well

under way, but ultimate designs are for a much more extensive development. The jetties extending from either bank of the Brazos project into the Gulf approximately one mile, terminating in 21 to 24 feet of water, as shown by Government soundings of March, 1912. These jetties are maintained by the Government, and are designed to provide at least 18 feet of water over the bar and through the channel at mean low tide. The extension of the jetties to secure 25 feet of water is easily possible, and an application to the Rivers and Harbors Commission for resurvey as a preliminary has received favorable Congressional action. While a depth of 25 feet will accommodate practically every vessel that reaches Texas waters, 30 feet is the ultimate expectation of the Freeport harbor.

The Freeport harbor is land-locked, and is safe in a degree which has secured favorable comment from many captains who are familiar with it. Once inside the mouth of the Brazos jetties, no harm can come to a vessel through storm.

The Government is spending a big appropriation on the improvement of the Brazos from its mouth to Waco. The work is well along, and when completed will afford navigation for vessels of light draft from Freeport to Waco, or over 400 miles of water distribution, penetrating to the heart of the State.



THE POWER PLANT, SULPHUR WELL AND SULPHUR DELIVERY PIPE LEADING TO THE STORAGE BIN.



A NEARBY VIEW OF A STORAGE BIN AT THE FREEPORT SULPHUR COMPANY'S MINES. Showing the bin, ten feet high, almost completely filled with pure sulphur.



# From Dallas to Bonham Through the Heart of Texas

## An Interurban Railroad Which Sets a Standard for All Electric Lines

**ONE** of the most interesting of the many lines which are making Dallas, Texas, a notably important interurban railway center is that of the Eastern Texas Traction Co. It is interesting because it was originated, planned and carried through, in the face of great obstacles and opposition, by local interests not previously identified with interurban railway promotion, because it has scooped up from its competitive interests one of the richest territories to be found, and, finally, because it is to be operated with reference to serving the people and developing the resources of the territory it covers.

The line will run from Dallas to Bonham through the counties of Dallas, Rockwall, Collin, Hunt and Fannin, and the cities and towns of Garland, Rockwall, Fate, Royse, Josephine, Caddo Mills, Greenville and Wolfe City. It will have a total length of 91 miles. The territory penetrated is the very cream of the black lands of Texas, and in density of population is ahead of any other portion of Texas, and compares favorably with any territory anywhere. The population of the five counties, one of which is very diminutive in size, is about 400,000, and according to the reports of engineers there is not a mile of the road that will not be self-sustaining, a condition said to be without a parallel on any other interurban road in the United States.

Construction work is well under way. The stretch between Dallas and Garland is about ready for the rails and will be operated as soon as completed. Work is also going ahead between Garland and Greenville, and engineering work is being done between Greenville and Bonham. The Dallas-Garland stretch will be completed within a few weeks and the entire line between Dallas and Greenville is expected to be completed and in operation by October 1st.

In the plan of operation of the Eastern Texas Traction Co.'s lines some novel innovations have been introduced. Several of these are strikingly original and all are in harmony with the policy of the management to give the greatest service to the people along the line and to co-operate to the fullest extent in the development of the cities, towns and country in population, diversified farming, dairying, manufacturing, etc. It is a fixed idea of the management that the greater the friendship between the corporation and the people in the territory served the greater the advantage will be to all concerned.

Among the features of the services rendered is the installation of a private telephone system for use of country merchants along the line. Any merchant wanting to give an order in Dallas or elsewhere will have free use of it at any time. At the general offices of the traction company there will be an organization devoted to the service of these merchants. Through this system a merchant having with him the catalogue of the jobbers in Dallas and other points along the line will be able to fill an order for merchandise, farming implements or anything required by the customer simply by calling up the jobber and giving the catalogue number. The traction company's organization will see that delivery of the purchase is expedited, so that the country merchant will be able to fill an order within two or three hours that under ordinary circumstances would require several days.

This will give the country merchant access to the entire stock of the city jobber, so that he will not then be required to load up with a stock of slow-selling merchandise. He can simply order the goods as required, and besides getting the benefit of the entire stock the wholesaler carries will still be able to buy on the present 60 and 90 days datings. He can thus handle more goods at a better profit without tying up a large amount of capital.

The system also practically gives the country customer the benefit of Dallas stores and obviates the necessity of going to town to shop. He can tell his country merchant what he wants and return to his work while his order is being filled. The system thus operates to the advantage of everybody—the city jobber is benefited, the country merchant does a larger business at less cost than heretofore, and the country customer is saved time and expense. The system thus operates to build up the country merchant instead of drawing business away from him, and promotes good feeling throughout the entire territory served by the road.

In operation, the traction company will carry express packages up to 25 pounds on every car that goes out. There will be three kinds of trains: a limited train, making four trips each way daily, with no stop between the principal cities; six express trains daily, stopping at towns only, and local trains, stopping at all wayside stations and towns. Also there will be a baggage train exclusively, which will make all necessary stops. All way station platforms will be car-door high, so farmers can load and unload with the greatest convenience. There will be two early express trains each way from Rockwall to Dallas and Rockwall to Greenville, so that butter, poultry, eggs and all kinds of vegetables and berries will arrive at Dallas and Greenville at 6.30 every morning. This service will be an incentive to the people to raise produce of this description.

The express department will be provided with facilities for the immediate delivery to hotels, merchants, etc., of all produce entrusted to it, and the industrial department, which has been organized, will assist in getting contracts for farmers and producers with hotels and other purchasers in the cities, with the idea that in the end all the producer will have to do will be to deliver his wares at the traction company's station platform.

The company has organized an agricultural department, somewhat on the line of similar departments already created by the steam railroads of the country, but it is intended to make it even more effective, because the work can be concentrated in a smaller territory. Under the direction of a qualified

chief, this department will be devoted to encouraging truck farming, dairying, etc., in all the territory along the line. There will be lectures with demonstrations calculated to educate and encourage the departure from exclusive cotton growing, and the undertaking of truck farming, fruit growing, etc., the benefit accruing to the railroad through the increased tonnage being thereby simply a reflection of the general prosperity which diversification will bring about.

The agricultural department will be thoroughly equipped and strongly backed financially.

There will be an industrial department devoted to securing the development industrially of the entire territory. The industrial commissioner will co-operate with the commercial organizations of Dallas and cities along the line, keeping up the interest of the members and doing everything possible to assist in securing manufactories for the section. A special industrial agent will be in the field all the time, and this will be a vitalized, energetic force in the development work being done by the traction company.

In advance of the operation of the railroad a factory was secured for one of the towns served by the traction company, which is an indication of the alertness and energy with which the policy of the road is being followed out. There will be no lagging in this work, and in every way the company will co-operate in the development of the country with the idea that industries, diversification and development will bring prosperity to the people and to the railroad company as well.

In aid of this undertaking a magazine will be printed monthly, devoted exclusively to the interests of the road and the territory it covers. It will be an industrial, farm and stock journal, conducted on a broad-gauged plan of benefit to the people of every calling who live in the territory served, as well as containing information of interest and value to the outsider who may be seeking a new location.

A commercial agent, already appointed, will devote his entire time to building up the passenger business of the line as well as the express business. He will work up theater parties, excursions, etc., in towns and cities along the road and within easy reach.

In the line of good service, and to secure and retain the good will of the people in the territory through which the road runs, the greatest precautions possible will be taken to prevent accidents. There will be three systems of dispatching—telephone, telegraph and block signals. At all crossings there will be bells in the day time, which will be automatically rung by cars 200 yards before they reach the crossing. At night there will be red lights at crossings in addition to the bell. Every means will be adopted to prevent injury to people and property and avoid occasion for damage suits. The line will be operated on the theory that a public service corporation is not only under obligations to give the public the best possible service, but that it is likewise of the greatest personal advantage to the corporation to keep in touch with the people and establish and maintain friendly relations with them.

The rolling stock of the company will be as distinctive as its policy of operation. An order has already been placed for 14 cars to be delivered within eight months. They are of the latest improved pattern, with turtle-back ventilators, and are painted battleship gray, which will give them decided individuality among the urban and interurban car equipment of Dallas. In addition to cars for regular service, there will be handsomely finished parlor cars for theater parties and special occasions.

In the construction of the road wooden trestles are eliminated wherever possible, and the culverts of any size are of concrete. There will be a concrete viaduct across the Elm Fork of Trinity River, between Rockwall and Garland, 2200 feet in length.

The work of the engineering department has been inspected and approved by some of the best consulting engineers in the country, and from an engineering standpoint the line is of the very best.

In every respect the construction and equipment will be of the highest standard, so that there will be no better built, equipped or managed road among the interurban lines in Texas or anywhere else, and, first and last, it will be a developer and upbuilder of the section it serves.

The officers and staff of the company are: President, Forest E. White, Dallas; active vice-president and general manager, J. W. Crotty, Dallas; vice-president and general counsel, Joseph F. Nichols, Greenville; vice-president, W. A. Williams, Greenville; secretary, I. A. Miller, Dallas; assistant secretary, J. L. Coughran, Dallas; treasurer, Ellis Birdsong, Greenville; general attorney, Alex F. Weisberg, Dallas; chief engineer, William A. Obenchain, Jr., Dallas; assistant chief engineer, B. T. Quarles, Dallas; general passenger and ticket agent, S. A. Stemmons, Dallas; right-of-way and claim agent, Asher Mintz, Dallas; special representative, Paul S. Miller, Dallas; industrial agent, Ralph Wade, Dallas; commercial agent, F. E. Hendricks, Garland; purchasing agent, C. M. Wenzler, Dallas; manager of express department, W. M. Fechheimer, Dallas; chief surgeon, Dr. E. P. Becton, Greenville; superintendent of properties, T. H. Obenchain, Dallas; general contractors, Karner Bros., Dallas.

There are about 900 owners of stock in the territory along the line, and the board of directors will be composed of leading citizens who are owners of the stock. A general superintendent will be selected with special reference to his ability as an operating man. Also the entire operating department will be filled with men experienced in their line of work.

A decided impetus in the growth and development of the towns and cities touched, as well as improvement and expansion in farming operations, will undoubtedly result from the stimulating influence the road will exert. The

already prosperous communities will be aided in industrial and commercial development through the organized and systematic plans that the Eastern Texas Traction Co. will carry out. A brief summary of conditions in the towns and cities to be served, and of the surrounding territory, will give some indication of the possibilities in development the section contains.

Garland, with a present population of 1200, is 15 miles northeast of Dallas, in Dallas county, and is on the Missouri, Kansas & Texas and Santa Fe Railways. It is surrounded by some of the finest farm lands of North Texas, occupied mainly by small farm owners. Garland is the market place by wagon of from 12,000 to 20,000 bales of cotton annually, which makes it a particularly favorable location for the establishment of a cotton compress. It has three cotton gins, \$25,000 ice plant and cold-storage warehouse. It has new school buildings, brick business houses and is incorporating under a special charter to issue improvement bonds. Its two banks have \$185,000 capital and surplus, and \$750,000 deposits. The citizenship is eager to aid in securing industries and will co-operate with stock subscriptions, etc., for the location of such industries as are feasible—notably another cotton gin, oil mill, cotton compress, creamery, etc.

Rockwall, 2000 population, is the county-seat of Rockwall county, which, although one of the very smallest, is as rich a county as Texas contains, as is indicated by the fact that 31,000 bales of cotton were marketed here last year. It is midway between Dallas and Greenville. It has an abundant supply of artesian water, sufficient for all kinds of manufacturing purposes. It has two banks, forty business houses, a \$35,000 courthouse, a \$25,000 public school building and a \$15,000 Methodist brick church is under construction. There is a cottonseed oil mill, an electric-light plant and an ice plant. An oil company is being organized to drill for oil, with the belief that an oil field will be developed. It wants other industries.

Royse is a thriving town of 1600 in Rockwall county. It has two banks, capital and surplus \$112,500, deposits \$300,000; three gins, cotton oil mill, flouring mill, electric-light plant, ice factory, five large dry-goods stores, six grocery stores, three drug stores, two jewelry stores, 25-room brick hotel, \$15,000 brick schoolhouse, two big lumber yards, city-owned water-works, four handsome church buildings, miles of concrete sidewalks, and many handsome residences. The town needs a cotton mill, cotton compress, brick plant, for which there is plenty of excellent shale; a dairy and other enterprises of various kinds.

Fate is a small town with a fine outlying territory of black waxy land. It has two ginning plants, with capacity of 40 bales a day each; bank, stores, etc., and a \$15,000 brick school building.

Josephine, in the southeastern portion of Collin county, now served only by the Cotton Belt road, is anticipating much benefit from the coming of the Eastern Texas Traction Co.'s line. With a population of about 700, it is fairly well supplied with stores, banks, etc., and has two cotton gins. Being surrounded by rich farming lands, worth \$100 to \$150 an acre, its citizens feel that a greater growth is justified. They want another gin, an up-to-date lumber yard, a cottonseed-oil mill and more stores, and would co-operate in the establishment of the same.

Caddo Mills, unincorporated, is a town of 500 people, "all white," so the chroniclers state, located nine miles west of Greenville, on Caddo Creek, which is susceptible of hydro-electric development. There are four cotton gins in operation, and more than 6000 bales of cotton are marketed there during a season. The people will liberally subscribe for stock in a cottonseed oil mill, a grain elevator and a brick plant (shale being right at hand), in case an experienced, capable man will go there to engage in either or all of those lines.

Greenville, county-seat of Hunt county, 54 miles northeast of Dallas, the most important city touched by the Eastern Texas Traction Co.'s line, outside of Dallas, is a city of about 14,000 people. It is a railroad center, and its present position as the metropolis of a large and fertile region will unquestionably be augmented as East Texas development progresses. On top of present industrial and commercial development, it is proposed to build up other industries and expand the ones already located; to foster and promote the jobbing trade; to increase the banking capital, and to extend and perfect all the facilities required for the upbuilding of the kind of metropolis East Texas will require. Greenville will have the general offices of the Eastern Texas Traction Co., which will have a direct personal interest in seeing every sort of development carried out. Greenville has a Chamber of Commerce, which is alert and active in taking hold of any helpful proposition. Greenville is a city of churches, of schools and colleges, has ten miles of paved streets and a bond issue to provide seven other miles. It has a commission government, municipally-owned light and water plants, a modern

and efficient fire department, and 65 acres of parks and public playgrounds. It claims the largest cotton compress in the South and the largest cottonseed oil refinery. There are machine shops, carriage and wagon factory, three planing-mills, flour mill, mattress factory, broom factory, candy factories, grain elevator, etc. Bank deposits total more than \$2,500,000. It has an electric street railway system with eight miles of track and modern equipment. The Texas Midland Railway Company has recently inaugurated a motor-car service between Greenville and various points on the Midland road. With the Eastern Texas Traction Co.'s lines, providing feeders to the southwest and north, and with the possibilities of additional steam railway construction in the not remote future, Greenville's transportation facilities will be of unsurpassed excellence.

The farming country around Greenville is exceptionally rich, and is adapted to intensive farming, dairying, truck growing, etc. It raises as much as 85 bushels of corn per acre for an entire field and a bale to the acre of cotton.

The Chamber of Commerce points out the especial need right now of cotton mills, overalls and jumper factory, furniture factory, wholesale hardware and wholesale drug houses, creamery and cheese factory, and will co-operate in the establishment of these and other enterprises.

Wolfe City, on the Greenville-Bonham line, is a town of some 2200 population. It is called the "City of Seven Hills," on account of its topographical situation, and it has a beautiful and picturesque location. It is now served by the Cotton Belt, Frisco and Santa Fe railroads. There are schools and churches, ample banking facilities, many substantial and successful mercantile enterprises, 300-barrel flour mill, large cottonseed-oil mill, electric lights, water-works in fire district. The city markets from 12,000 to 15,000 bales of cotton in a season. The city will offer inducements to reliable parties to put in a good sewer system, improved water-works, compress, ice factory, creamery, steam laundry and any other practicable proposition looking for a good location.

Bonham, the county-seat of Fannin county, is near the center of the county and has a population of 6000. It has two steam railroads, the Texas & Pacific and the Missouri, Kansas & Texas, and an electric car line. It draws its support mainly from the rich country surrounding it, supplemented by a number of manufacturing plants. Bonham has splendid public schools and a good private school for girls. Its high school ranks as one of the best in the State, and is affiliated with the State University and with every other leading university in the South. In the curriculum is included the departments of Domestic Science, Domestic Art, Manual Training and Agriculture.

There are ten church buildings for the white population, among which are some beautiful structures, including Baptist, Methodist, Disciple, Presbyterian, Episcopal and Roman Catholic.

During the year 1912 the farmers marketed in Bonham cotton worth \$1,300,000, besides large quantities of corn, wheat, oats, hay, horses and mules, hogs, poultry and eggs.

The town has seven dry-goods houses and three men's furnishing stores that do an annual business of \$400,000; three hardware and implement houses that do a business of \$200,000; three banks doing a business of nearly \$2,000,000; a wholesale grocery house doing \$500,000; a wholesale dry-goods house just organized, three furniture stores, and the usual run of retail stores of all kinds. The city supports two excellent newspapers, one of which issues a daily and a weekly edition, and the other a semi-weekly.

A cotton mill manufactures 4000 bales of cotton per year into cloth, and gives employment to 250 operators.

A cotton mill grinds annually 5000 to 7000 tons of cottonseed. There is a flour mill with a daily capacity of 200 barrels of flour, an elevator, compress, ice factory, creamery, two cotton gins, electric light plant, and a number of other smaller manufacturing plants. This is a division point of the Texas & Pacific Railroad, which maintains a roundhouse and machine shops here, with a monthly payroll to local employes of about \$18,000.

The city owns and maintains its own water-works and sewer systems. The water supply is pure and unlimited in quantity. A number of the principal streets are paved with rock asphalt and further paving is now under way. Concrete sidewalks reach to every part of the city. Fuel is abundant and cheap, various coal fields lying within 75 miles to the north, 150 miles to the west and 150 miles to the east. The citizens are ready to welcome and encourage every legitimate business enterprise.

Detailed information regarding any of the towns traversed by the Eastern Texas Traction Co.'s line can be secured by addressing Ralph Wade, Industrial Agent, Dallas, Texas.



RICH SECTION TO BE SERVED BY EASTERN TEXAS TRACTION CO.





ARMOUR FERTILIZER WORKS, JACKSONVILLE, FLA.

## The Foundation Business of Civilization

**T**HE average man is duly impressed with Secretary Wilson's report, showing an increase of forty or forty-five millions of dollars in excess of the previous year. With a profound respect for the resources of the country and a grateful feeling that business will be good, the subject is dropped. With most of us crops, like Topsy, "just grew," probably because the subject is a homely one. The importance of good crops is realized by all of us, but the part played by man in effecting to the fullest extent their fruitfulness is not.

The average man credits prosperity to the modern labor-saving devices, "our wonderful resources" and "virgin soil."

Machinery, climate and soil, without the food that plants feed upon, would be only means to an end. The earliest farmer, with soil that was "virgin" in the fullest meaning of the word, experienced this truth in the shape of crop failure in "ideal seasons." The easiest solution was to move his garden and plant on new soil.

Clearings were not always available, so brush was removed by burning. Better crops resulted on such plots. The addition of refuse matter such as meat, fish, etc., from primitive kitchens also helped. Bones were known to make the grape of early Roman days thrive, and they were buried whole around the roots. In Japan manure from animals, even human excrement, has been employed for over a thousand years to keep up the fertility of the soil. The why was a mystery for centuries, until the famous German chemist, Liebig, after sixteen years of experiments and study, gave to the world his theory of plant food and plant feeding. Liebig showed that plant food consists of certain elements, all of which must be present in the soil for the proper growth of plants; also that part of this plant food is removed with each crop, and must be replaced if the soil is to be expected to grow and mature good crops the following season.

The three most necessary of these elements are nitrogen, available phosphoric acid and potash. Wood ashes contain potash, which accounts for the better crop that followed on soil from which the brush was cleared by burning. Refuse animal matter contains ammonia. Bones furnish phosphoric acid. The primitive farmer was feeding his plants as truly as we are today. His practice was sound, only it remained for the modern chemist to explain the why of it.

To Liebig modern agriculture is more indebted than to any other man. The growing of crops for food and for raiment is man's most vital necessity. It is the very foundation of "business." Alongside, mineral wealth is simply an incidental.

The United States, a comparatively new country, with miles of the best tillable lands, a growing population still within the number that our production can feed—the problem of crops has not until recently caused us any anxiety. At the present time, with practically every available acre taken, a population rapidly reaching the one hundred million mark, we are commencing to realize that our vaunted virgin soil is playing out. A glance at our exports of farm crops ten years ago and now brings us face to face with the question—Where is our food coming from?

In Europe the problem was acute years ago, and the results of farming methods practiced there since are a safe guide for the American farmer, and show that the food problem need never become a pressing one with us. If we but recognize the principles laid down by Liebig, along with the better methods of tillage, seed selection, seed testing, crop rotation that we already practice, we have as our goal crops not only enough for our domestic needs, but a surplus that will again place us in the foremost ranks of crop-exporting countries.

The farmer of the South was among the first to recognize the necessity of keeping up the fertility of the soil by applying fertilizers. However, he has not reached the maximum, and the judicious selection of the right kind of fertilizer, applying it in the right amounts and the right way, along with a crop rotation and a diversifying of his crops, will lead to better profits, due to a lower cost of production per acre, and make him more self-supporting. Instead of growing less than a third of a bale of cotton per acre, he should grow at least a bale. This would lower the cost of growing cotton and give him more land for other

crops. Clover, corn, hay and forage crops would support the needed live-stock and make the Southerner independent of Northern producers who now supply his meats and feed for his dairy cows, horses and mules.

With the advantages in the South, such as climate, grazing the year around and the large amount of concentrated feed from the by-products of the cotton-seed, it is better adapted to the live-stock industry than any other section of the country. Once the Southern farmer commences to produce his present production of cotton on a third of land now employed for the purpose and adds other crops to his scheme of farming and takes up the live-stock raising question seriously, the good old days will be lost sight of in the present good times.

The other sections of the country have as serious a problem confronting them as the South. Their average wheat yield is twelve and one-half bushels per acre. Germany's is thirty-one. A similar comparison with almost the same showing can be made with the crops of every country in Europe. The yield of wheat in Germany is double that of a generation ago. European agricultural authorities are unanimous in giving almost 70 per cent. of the credit of their increased yields to their practice of Liebig's theory, viz.: keeping the soil supplied with plant food.

Plant food—that is, nitrogen, available phosphoric acid and potash—is the keystone of good crops, and in its preparation more true conservation is practiced than in any other industry. The foremost example of this is the utilization of the former "waste" of large slaughtering establishments, such as blood, bones, meat scraps, commonly termed tankage, etc.

The former waste products of the packing-house, when combined with acid phosphate and potash salts, are the most effective means at the command of the American farmer to help nature grow not only larger crops, but crops of better quality.

The house of Armour, with its immense slaughter houses in the centers of the large live-stock sections, was the pioneer in "conservation," and "Nothing lost but the squeal" has become an axiom in the packing industry. The blood, bones and tankage, after being cooked, dried and ground, are distributed to the large factories, erected in all the convenient distributing centers of the country, ready to be formulated into fertilizer.

The enormous supplies at their disposal has made the business of making fertilizer a necessary adjunct. With the usual efficiency and exactness that characterizes all the work of this firm, the business of utilizing their by-products was, from the very start, conducted along the most modern scientific lines.

A typical Armour plant is shown above. Occupying a space of a little over one-quarter mile long, it is conveniently situated, having direct access to both rail and steamship transportation.

Electric power is developed on the premises. Pyrites ore from Spain is converted into sulphuric acid for the manufacture of acid phosphate from phosphate rock. Potash vessels from Germany dock at the plant, and dried blood, bone meal, tankage are received from Fort Worth, Kansas City, Chicago, St. Louis and other Armour packing-houses.

This plant has a capacity of from 40 to 50 thousand tons annually, and during the rush season turns out from 30 to 35 carloads of 25 tons each daily.

A modern laboratory, under the supervision of an able chemist, insures fertilizers formulated right, analyzing up to guarantee and suited for the purpose for which they are recommended. The equipment of the factory and the material used are a standing guarantee of mechanical and drillable condition. The thirty Armour fertilizer factories in the United States necessitate a traveling force of expert engineers, manufacturing superintendents, trained machinists and chemists, who travel from one plant to the other, overseeing the resident engineers, chemists, etc. Constant overseeing provides for the maximum efficiency and a never-varying of the "Armour Quality," which has been the watchword of that institution. The saying "a satisfied customer is the best advertisement" is probably more true of the fertilizer business than of any other. The constantly-increasing use of the Armour fertilizers is ample evidence of the satisfaction the Armour brands give, and that farmers everywhere can depend on them to enrich the soil, increase the yield, improve the quality and hasten maturity.

# Camp Manufacturing Company—A Stalwart Southern Lumber Concern

*"A Story of Well Merited Success Which Should Be An Inspiration to Others"*



WHEN in 1876 Paul D. Camp, then a young man of 27, began the manufacture of lumber at Franklin, Va., on a scale that produced about 1,500,000 feet a year, he probably did not dream that he was laying the foundation of a business that would grow in less than forty years to one hundred and twenty times its initial size. Yet that was what he was doing, for that small operation was the beginning of the Camp Manufacturing Co., now one of the stalwart lumber manufacturing concerns of the South, having mills in several States, offices in many cities, and an annual output of 180,000,000 feet of lumber.

The Camp Manufacturing Co., as now composed, consists of Dr. Benjamin Franklin Camp of White Springs, Fla.; Paul Douglas Camp, Robert Judson Camp and James Leonidas Camp of Franklin, Va. These brothers are sons of a family that has for generations been helping to make history in Virginia and the South, and the lives of whose members have been closely identified with the progress and development of that State and section. In the lives and works of this younger generation is well illustrated the spirit of enterprise that is making the South the country's most prosperous and progressive section.

It was shortly after the Civil War had ended, and while the hand of desolation still lay heavy upon the South, which was then struggling to regain something of its ancient prestige in the country's commerce and industry, that these Camp brothers began to arrive at the age of manhood, and they were quick to see and ready to grasp the opportunities that lay thick about them. They realized the fact that, no matter how dark the cloud that then hung over the South, brighter days were sure to dawn, for no country so richly endowed by nature could be perpetually held in commercial and industrial subjection. They recognized the fact that lumber, one of the prime necessities in the economic life of a growing and developing country, would naturally increase in value as forests were cleared and cities were being built—as the supply kept diminishing and the demand kept increasing—and that those who secured large forest acreages would be sure of sale for their holdings at greatly increased prices, or would have the timber to manufacture when the price of manufactured lumber had reached much larger proportions. They therefore began to buy timber lands with whatever of money they could spare from the operation of their growing business, a policy they have kept up to the present day, broadening its scope from year to year, with the result that they now are the owners of some of the most valuable tracts of timber lands to be found in the entire South.

As stated in the outset, in 1876 Paul D. Camp began the manufacture of lumber at Franklin with a mill that cut about 1,500,000 feet annually. Four years later he took into partnership his brother, J. L. Camp, and the firm became P. D. & J. L. Camp. The capacity of the mill was increased to about 5,000,000 feet a year, and it ran at that until 1886, when the firm bought a circular mill located at Franklin from R. J. & J. W. Neely, improving and enlarging it until it had a capacity of 12,000,000 feet annually. The business ran along this way until April 1, 1887, when the Camp Manufacturing Co. was organized, and four other brothers were taken in. From that time the business began to be enlarged in all directions. Each of the brothers had been engaged in the lumber business in some of its various branches, and each was an expert in his line. Some of them had taken logging contracts when mere boys, cutting the trees in the forest and delivering the logs to the mills belonging to other people; some had operated mills—among them they knew the lumber business "from the ground up." Not only were they thus experienced in their business—they were strong, able-bodied young men, not afraid of work, and each of them able to "make a hand" in any department where a hand was needed. Working thus together, giving the full strength of hand and heart and brain to the undertaking, they have achieved a success that should be an inspiration to young men wherever the history of their lives is known.

The officers of the Camp Manufacturing Co. are P. D. Camp, president; J. L. Camp, vice-president and general manager; R. J. Camp, secretary and treasurer. The company is operating mills at Franklin, Va.; Butterworth, Va.; Arringdale, Va., and Wilmington, N. C., and in addition owns the controlling interest and has full charge of the operation of a large plant at Marion, S. C., and various other places.

The plant at Franklin, covering the site of the company's first mill, has a daily output of about 175,000 feet when worked with double shift, and employs about 700 men on the mill proper and in the woods. The equipment consists of two band mills, gang saw and such other machinery as is required to prepare lumber for the sticks and kilns. In connection with the sawmill there is a planing mill with a daily capacity of 125,000 feet. The planing mill has an independent power-plant, with a 500-horse-power Corliss engine, fed by a battery of four 150-horse-power boilers. It has dressing and matching machines, band resaws, edgers, rip saws and all the equipment necessary to carry on the work in the best style. Shed room is provided for 1,000,000 feet of dressed stock, and the sheds are generally full. The lumber is transferred from place to place in the process of manufacture and drying by electric motor trucks, and all appliances are of the most modern and up-to-date character. In the logging operations many miles of narrow-gauge railway are utilized, and for the purpose of constructing cars, locomotives and other equipment extensive repair and machine shops are maintained at the Franklin plant.

The plant at Butterworth, Va., on the R. P. & C. division of the Seaboard Air Line Railway, and known as the "Butterworth" mill, was established in

1902. This is a two-band mill plant, with a horizontal resaw, and has a capacity of 75,000 feet a day. It has a well-equipped planing mill, which makes flooring, siding, ceiling and finish. The plant, including sawmill, planing mill, drykilns, storage shed, yard repair shops, covers twenty acres. From 275 to 300 men are employed to log and run this plant. Extensive machine and repair shops are maintained here also.

The Arringdale plant consists of a sawmill with two band saws and the necessary edgers and trimmers, a planing mill thoroughly equipped, storage sheds, drykilns and other appurtenances belonging to a modern plant of this kind. The sawmill has a daily capacity of 60,000 feet, the planing mill of 50,000 feet. The men employed in logging and running the mill number about 215.

The plant at Wilmington, N. C., is situated on the northeast branch of the Cape Fear River, which has been in operation since the year of 1910. This is a two-band mill plant, with a horizontal resaw, and has a capacity of about 100,000 feet per day. It also has a well-equipped planing mill, which makes flooring, ceiling, siding and finish. The plant includes sawmill, planing mill, drykilns, storage sheds, yard, repair shops, and covers some fifteen acres of land. There are employed to log and run this plant 280 to 300 men. This plant has the advantage of both water and rail shipping facilities.

In connection with each of these mills the company owns large boundaries of lands, with sufficient timber to run them for a number of years. All told, the Camp Manufacturing Co. owns and is interested in the ownership of standing timber aggregating about 1,500,000,000 feet. Among other large boundaries it has about 50,000 acres in the famous Dismal Swamp, the timber of which is estimated at 400,000,000 feet.

The business activities of the Camp brothers are not confined to the lumber business, for, strenuous as they have found that calling, it does not furnish sufficient scope for their energies and enterprise, and the consequence is that each one of them has interested himself in numerous other things.

Paul D. Camp, in addition to being president of the Camp Manufacturing Co., is president and director of the Crystal River Lumber Co., Crystal River, Fla.; is secretary and treasurer and director of the Cape Fear Lumber Co., Wilmington, N. C.; is a director of the Marion County Lumber Co., Marion, S. C., and a director of the Giles County Lumber Co., Franklin, Va. He is president of the Albion Mining & Manufacturing Co., Franklin, Va., and Newberry, Fla., and of the Franklin Phosphate Co., Newberry, Fla., and of the Greenville & Dinwiddie Railroad Co., which operates a railroad in Greenville and Dinwiddie counties, Virginia. He is interested financially in various other companies as well.

Dr. B. F. Camp, in addition to his holdings in the Camp Manufacturing Co., is interested in the Cape Fear Lumber Co. of Wilmington, N. C.; the Marion County Lumber Co. of Marion, S. C., and the Crystal River Lumber Co., Crystal River, Fla., being vice-president of the last named; is vice-president of the Franklin Phosphate Co. of Newberry, Fla.; president of R. J. & B. F. Camp Lumber Co. of White Springs, Fla., and interested in the Albion Mining & Manufacturing Co. of Franklin, Va., and Newberry, Fla.; is vice-president of Judson Lumber Corporation of Carrabelle, Fla., and numerous other industrial and commercial concerns.

Robert J. Camp, secretary and treasurer of the Camp Manufacturing Co., is also a director in the Meherrin Valley Bank of Boykins, Va.; director and secretary and treasurer of the Albion Mining & Manufacturing Co. of Franklin, Va., and Newberry, Fla.; vice-president of R. J. & B. F. Camp Lumber Co. of White Springs, Fla.; also secretary and treasurer of the Marion County Lumber Co. of Marion, S. C. He has been a member of the Town Council of Franklin and chairman of its Finance Committee for years, serving the public with the same diligence and intelligence with which he attends to his private business. He has been a member for years of the North Carolina Pine Association, serving for several terms as vice-president from Virginia, and for many terms as chairman of its Price List Committee. In 1902 he was appointed by the Governor of Virginia a member of the State Board of Fisheries. He is a member of the Westmoreland Club of Richmond, and of the Virginia Club, the Board of Trade and the Business Men's Association of Norfolk. He is interested as a stockholder in many other enterprises of various kinds.

J. L. Camp, vice-president and general manager of the Camp Manufacturing Co., is also interested in the Cape Fear Lumber Co., the Marion County Lumber Co. and the Crystal River Lumber Co. He is president of the Roanoke Railway Co. of Thelma, N. C., as well as director of said company, and a director in the S. M. Price Machinery Co. of Norfolk. He is also president and general manager of Marion County Lumber Co. of Marion, S. C., and Cape Fear Lumber Co. of Wilmington, N. C., and vice-president of Giles County Lumber Co. of Franklin, Va. He has a large farm in Southampton county, which is operated under his personal supervision, and in which he takes great interest.

All these brothers, having spent most of their lives in the open, are fond of outdoor pursuits, and take delight in fishing, hunting and kindred avocations. They all have handsome homes, surrounded by beautiful grounds set with stately trees, in which they live wholesome, happy lives, raising families of attractive girls and sturdy boys, for whom nothing better can be wished than that they shall emulate in their careers the business probity, the aggressive enterprise and the broad, comprehensive scale of endeavor that have characterized the lives of their fathers.



# Kansas City Southern Railway

## The Shortest Line from Kansas City to the Gulf of Mexico

**T**HROUGHOUT its length of nearly 800 miles, straight as a crow flies, from the Kaw's Mouth to the Gulf of Mexico, the Kansas City Southern traverses a territory richer in variety of resources and possible development than any other line of railroad in the country of equal mileage. In the hands of capable, energetic and financially strong owners and operators, this road is destined to become notably successful as a railroad, while at the same time building up a territory great in potentialities of every kind. Agriculture, horticulture, small fruit raising, live-stock, mining, gas and oil and a variety of industrial operations constitute the lines of activity in which development is occurring in the territory, and in many of these no other section of the country can excel.

Within recent years the owners of the Kansas City Southern have spent large sums of money on improvements, reducing grades, improving the road bed, etc., with the intention of bringing the physical condition up to the highest standard, in the certainty that the development of traffic will call for the best facilities that the road can provide.

The Kansas City Southern is the shortest line between Kansas City and the Gulf; it is likewise the shortest line to Houston, through Southern Pacific connections, and it also forms, with its connections, a short line to New Orleans.

The principal items of tonnage are lumber from the Louisiana yellow pine forests, coal from Kansas and Arkansas, and agricultural products, including fruits, grain and grain products and cotton and cottonseed. It is the purpose of the management to increase the agricultural and industrial development of the territory covered by the road, and already the percentage of traffic outside of lumber and coal is materially increasing without any diminution in the total tonnage of the heavier items.

In Southern Missouri and Northern Arkansas, which has long been a well developed agricultural region, there has been added to farm crops, grains, mule raising, etc., the cultivation of apples, strawberries and peaches. Between Neosho and Siloam Springs, 324 carloads of strawberries were shipped during the past season.

At other points there are notable developments in fruit growing. Near Horatio, Ark., is what is said to be the largest peach orchard in the world, covering 3000 acres. From this orchard 600 cars of peaches were shipped last year, but, owing to the impossibility of getting hands for picking, there were some 300 carloads left on the trees. What has been accomplished in these lines is an indication of the favorable conditions which exist. When all the lands suitable for fruit culture along the line have been put in cultivation, fruit shipments will constitute an important part of the traffic of this line.

Joplin is famous as the greatest zinc mining camp anywhere. Its development is based on mining, and for an indefinite number of years this will be the dominant factor in its growth. Nevertheless, the country around Joplin is susceptible of extensive agricultural growth, and farming and stock raising will play an increasingly important part in its prosperity.

There are zinc developments at other points along the line, notably at Gillham, in Western Arkansas.

In various sections of the country along the southern half of the road cotton is grown in important quantities, and in the Red River Valley a notable development has been made in the growing of alfalfa. Corn is an important crop practically along the whole line. In a number of places the culture of peanuts is being encouraged, it having proved a very profitable crop not only

for the peanuts themselves, which are marketed or crushed for oil, but as a forage and stock feed.

From Vivian to Shreveport the Caddo oil field is traversed, a field greater in wealth of natural gas and high-grade petroleum than any other now producing.

From Shreveport to the coast the road runs through one of the greatest forests of yellow pine the country contains. At the earliest it will be a generation before this growth is harvested, and by that time cut-over lands will have become so greatly needed that the settlement of the country with agriculturists must take up these denuded forests well-nigh to the acre.

Tributary to Texarkana are the iron ore fields of East Texas. Here are a hundred or two million tons of the highest grade ore, averaging over 50 per cent. metallic iron. From 30,000,000 to 40,000,000 tons are directly tributary to Texarkana, and steps are being taken to interest the owners in the development of an iron making center at Texarkana. A good coking coal is found in the adjacent portions of Oklahoma on the Kansas City Southern Railroad. Announcement of important developments along this line is confidently expected in the early future.

Along the line of the Kansas City Southern are a number of cities and towns with interesting present developments and prospects for a much greater future. The first of these below Kansas City, the famed metropolis of the Missouri Valley, is Pittsburg, Kan. Pittsburg's present population is 18,000.

Its initial development is based on the fact that it is the center of the largest coal field between Illinois and Colorado, having a territory forty miles long by twenty miles wide. There are 10,000 coal miners in the Pittsburg district. Last year 5,500,000 tons of coal were mined, and this year the output will probably be 6,000,000 or 7,000,000. The quality ranks next to Pennsylvania's, which fact is probably a surprise to most newspaper readers. A typical analysis of the Pittsburg coal shows B. T. U. 13,199.

Volatile matter.....	32.04
Moisture.....	1.84
Fixed carbon.....	54.97
Ash.....	10.76
Sulphur.....	3.86

Besides the local market, Pittsburg coal is shipped as far away as Nebraska, to Oklahoma, throughout most of Kansas and along the western border of Missouri.

There is a considerable and varied industrial development at Pittsburg. The most important is the general repair shops of the Kansas City Southern Railroad. The plant, including shops, store and tracks, covers about

twenty acres of ground. The minimum number of hands employed is about 600, and the full force is 750. This being a division point, the railroad men employed on the road who make their homes here foot up about 1000, with a maximum payroll of about \$125,000.

The shops are the most extensive and the best equipped in the Central West south of Kansas City, and are modern and up to date in every respect. Outside of building cabooses, only repair work is done. About 900 freight cars are overhauled and repaired in a month, twelve to fifteen passenger cars and about sixteen engines, half of which are practically rebuilt.

The general stores of the shops carry a \$110,000 stock. The master mechanic's office is at Pittsburg, and also the office of the superintendent of machinery.

In addition to the company shops, there is a big foundry and machine works here, making coal mining machinery, equipment for smelters, etc., and iron works which will double their present capacity in order to handle the shovel



NEW UNION PASSENGER STATION, FT. SMITH, ARK.



STACKING ALFALFA NEAR SHREVEPORT, LA.

plants now in such extensive use in the coal fields. There are extensive deposits of clay and shale, at present utilized by vitrified brick and sewer pipe factories. The W. S. Dickey Clay Co. of Kansas City, which has a large plant here, has announced plans for a duplication of it, which means an expenditure of \$250,000. As there is an unlimited quantity and a great variety of clay and shale here, a great development of this industry is deemed inevitable.

Before the days of cheap natural gas there were smelters at Pittsburg. They have been idle for five or six years, but since the gas is playing out in the older gas regions they are coming back. One is in operation now, and negotiations are on for the return of another.

Joplin, with its 35,000 inhabitants, has developed into a modern, well-built city, having as a basis for its growth what is stated to be the greatest mining district in the world. Figured on the production of crude ore rather than upon the tonnage of concentrates, the Joplin district in the aggregate of its mining operations heads the list. Ore sales to the value of more than \$18,000 were reported for 1912. Zinc and lead will unquestionably be the large contributing factor in the prosperity of Joplin for many years to come, and will continue to make Joplin one of the richest cities in this State and section. Efforts are being made to bring about a greater industrial development, and leading citizens through their commercial organization are at work on plans to secure various new industries. Climate, soil and shipping facilities make possible a very extensive development also of agricultural and stock raising interests, so that a many-sided progress is outlined here.

A city of uncommonly promising prospects for progress is Fort Smith, Ark. With 30,000 population, all boosters, there is already an industrial development which shows an annual output of manufactured products of \$35,000,000. There are 110 factories, practically all financed by local capital. The people believe in doing things for themselves, and they are conspicuously active, having made, instead of inheriting, the fortunes they have. There are seven furniture factories, wood-working being a speciality. The largest wagon factory in the Southeast is here. There are also sash and door factories, a coffin factory and wheelbarrow works. The wood-working industries could be almost indefinitely extended, as Arkansas has 15 per cent. of the hardwoods of the United States and 25 per cent. of the oak. The furniture factories make only cheaper grades of furniture. Manufacturers of desks, office furniture and finer household furniture could operate to an advantage. There are iron works, stave mills, rolling mills, etc., as well as oil mills, biscuit and cracker factory, confectionery, overall and pants factories. There are two brick plants and, as an abundance of shale is available and the drainage requirements of Arkansas will provide a market for tiling, there is an opening for manufacturers of tiling, both for drainage and building purposes.

An interesting development in connection with the movement to secure industries is the acquisition of 155 acres north of the city, called the Cravens Place Factory Site, which has been bought by railroad and other interests and placed in the hands of three trustees, viz.: Messrs. C. W. L. Armour, Horace F. Rogers and R. R. Cravens. The tract is situated on the Fort Smith & Van Buren Railway, which has direct connections with the Kansas City Southern and Frisco lines. It is proposed to give sites free for factory locations, and switches will be built for every factory located on the ground.

Fort Smith is the gateway to 3500 square miles of semi-anthracite coal in Arkansas and Oklahoma. It is delivered in the city for domestic purposes at \$3.50 to \$4 a ton, and at factories at \$1.50 a ton for slack coal. Fort Smith has natural gas for domestic purposes. South of the city is also a large tract that the owners will donate for factory purposes and provide railway facilities.

Texarkana, outside of the iron ore developments already referred to, has already become an industrial and jobbing point of importance by reason of its geographical location and railway facilities. Two large creosoting plants turn out 3,000,000 ties and as high as 10,000,000 feet of other creosoted timber annually. There is an extensive glass factory, the first in the South.

A cooperage factory has a daily capacity of 1500 barrels, marketing its product in this and foreign countries. A casket factory turns out 100 caskets a day, and a furniture factory has an output of two carloads a day. There is a stove and metal products factory; also a tile factory, and among the miscellaneous industries is a plant for handling peanuts for wholesalers and candy manufacturers. Natural gas is available for commercial and industrial purposes, and raw materials abound for woodworking, clay products and other industries. With its shipping facilities and the cheapness and variety of raw materials, rapid development is considered certain to occur at Texarkana.

The possibilities for notable industrial and commercial developments at Shreveport are universally recognized. The natural gas field adjoining, and, in fact, underlying the town, is one of the richest and most extensive in the world. Shreveport was one of the places which aroused the enthusiastic interest of the German chemists who last year attended the International Convention. After spending a day in the oil and gas fields of the Caddo district, they left tremendously impressed with the possibilities for chemical manufactures at Shreveport. Already there has occurred a considerable development in the way of glass factories, iron works, woodworking plants, etc. With a citizenship alive to their opportunities, and with the co-operation of one of the most alert commercial organizations in the South, Shreveport's growth as an industrial center is assured. Favorable freight rates and transportation facilities are advantages which will inure to industrial progress, just as they have to the growth of Shreveport as one of the most important jobbing centers in the Southwest.

One of the southern termini of the Kansas City Southern is Lake Charles, La. Lake Charles is an old and well-established city of about 17,000 population, and is headquarters for extensive lumber interests operating in Western Louisiana.

Beaumont, on the main line, came into international fame through the discovery of the Spindle Top oil field in 1901. It had already become a smart town through its lumber and rice interests, and with the advent of the oil boom it greatly increased in population and wealth. It is now a well-built, well-paved and prosperous city of 25,000 people.

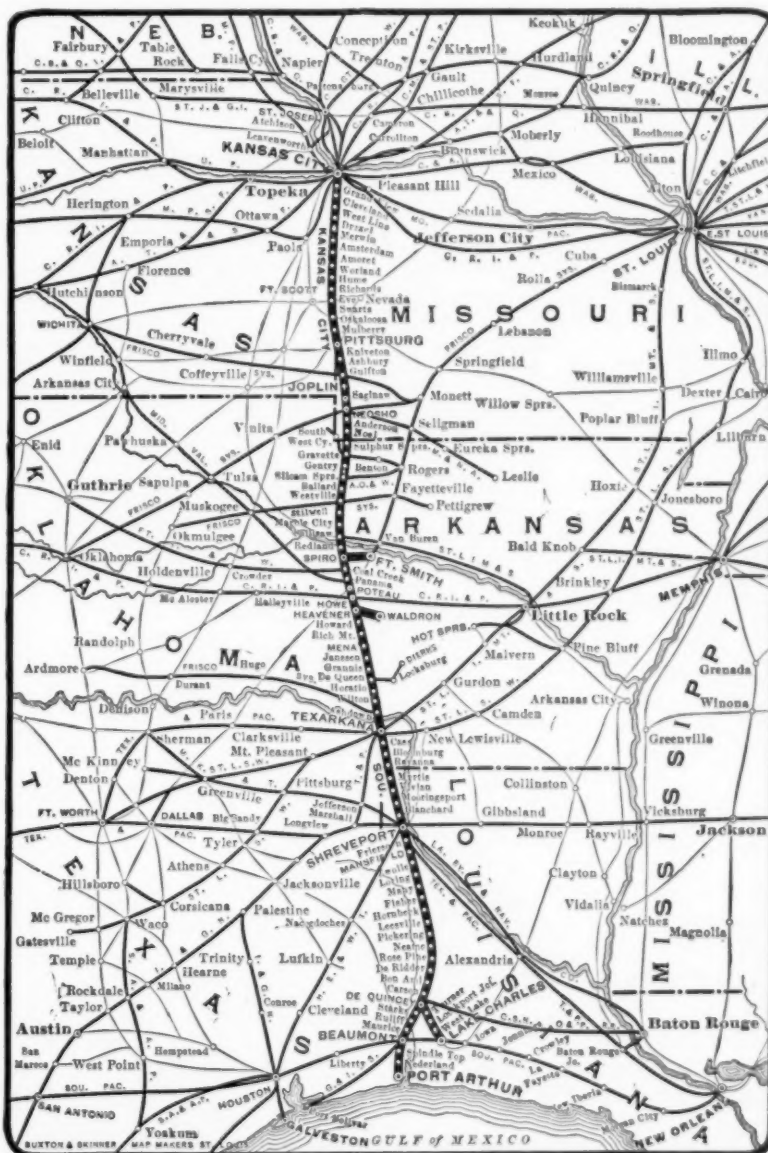
The Kansas City Southern terminates at Port Arthur. Ocean-going vessels leave Port Arthur through a canal 25 feet deep and 100 feet wide at the bottom, going around the shallow Sabine Lake and reaching the Gulf through Sabine Pass. Within 13 years Port Arthur has arisen from a "cow pasture port," as it was called in earlier days, to a position as the second largest port on the Texas coast. It has domestic and foreign commerce amounting to some \$45,000,000 a year, and more than 200 vessels enter and clear there annually. It is headquarters for several large oil companies, oil from the fields in Texas and Oklahoma being piped to Port Arthur for shipment in ocean-going vessels. Port Arthur is also a large general exporting port, and its commerce includes rice, sugar and many miscellaneous articles.

The Kansas City Southern, through the numerous fast-growing towns and increasing population along its line, affords to the manu-

facturer many opportunities for location where raw materials are abundant, and where a ready market for the finished product is at hand. The man who is looking for productive land at cheap figures can find it on the lines of this company. Inquiries addressed to William Nicholson, Immigration and industrial agent, Kansas City, Mo., will be promptly and cheerfully answered.



HARDWOOD TIMBER NEAR  
HEAVENER, OKLA.



MAP OF THE KANSAS CITY SOUTHERN RAILWAY.



# A County of Good Roads Without Indebtedness

## Muscogee County, Georgia, and Its Many Inviting Opportunities



MUSCOGEE COUNTY enjoys the distinction of having a smaller county tax rate than any other county in Georgia, with one inconspicuous exception, owes no bonds and no current indebtedness except that which it has the money on hand to pay, and yet has a network of good roads connecting all its parts, equipped with an imposing system of concrete and steel drains, culverts and bridges.

These advantages of county financing and business management come from a peculiar underlying cause, which should be carefully studied by every taxpayer in America. In 1872 Col. Louis F. Garrard, one of Muscogee's most devoted and patriotic citizens, induced the Legislature to enact a law establishing a board of commissioners, consisting of three members, chosen by the Grand Jury, and serving without pay, to have control of the police and fiscal affairs of Muscogee county. Colonel Garrard became a member of the first board chosen under this law, and for 35 years served the county in that capacity. Choosing the members of this board without regard to political claims, and from among men who were willing to serve without pay, the Grand Jury has been able always to secure the services of citizens of the highest class, and the action of the board has been marked throughout its existence by intelligent and devoted service and freedom from graft of every kind.

When, in 1907, Colonel Garrard resigned from the board he was succeeded by his son, Hon. Frank U. Garrard, one of the leaders of the Muscogee county bar. Mr. Garrard looks especially after the legal phases of the questions arising before the board, and in that way, as well as by his fine judgment on practical matters, renders service of the highest kind.

Serving with Mr. Garrard at the present time are Mr. L. A. Scarbrough and Mr. B. H. Hardaway. Mr. Scarbrough is a practical farmer and cotton warehouse man, who knows the needs of the farming community and looks after them in a most careful and painstaking manner. Mr. Hardaway is a famous civil

and constructing engineer, at the head of one of the greatest contracting companies in the South, than whom no man knows more about the construction of roads and other public improvements, and whose counsel and advice are of the highest value to the board and the county. The county has thus benefited, from the beginning of the present system of choosing commissioners, by the services of some of its leading citizens.

The Muscogee County Commissioners a number of years ago realized the fact that good roads must form the basis of any great agricultural development, and therefore put into effect a system of road building that had the effect to give the county good roads running from Columbus, its legal seat and principal city, into all sections of the county. These roads were well-graded and surfaced, and served to carry the traffic of the county for a number of years. Latterly, however, the rural population has grown to such an extent, and the traffic carried over the roads has assumed such proportions, that the commissioners saw there would have to be a general overhauling of the road system to keep it up to the demands made and to be made upon it.

They, therefore, entered upon a general plan of road-building that will put the highways of the county in condition not only to serve the purposes of the present, but also to meet the demands of the future for many years.

When the commissioners determined to begin this broader plan of road improvement their first step was to secure as engineer in charge of highways, bridges and public buildings, Mr. Julian R. Lane, an engineer, railroad builder and operator and highway constructor of wide experience and recognized ability, who was given entire charge of the work. The plan worked out by Mr. Lane embraces a road of the first class from the city of Columbus to the line of each of several adjoining counties, with second-class roads running out from these into the various important sections, and those of the third class reaching from these latter into all well-populated neighborhoods. The roads of the various classes differ in width only, the grading and surfacing of all being alike. Thus the inhabitants of every section of the county,

no matter how remote, will be able to reach the chief market of the county with full wagon-loads of whatever farm products they may desire to carry.

The roads of the first class are being made 40 feet wide as they leave the city streets, narrowing to 35 and then to 30 feet as they get farther into the country and less width is demanded to carry the traffic. The second-class roads are 25 feet wide, and the third class 20 feet. The county is fortunate in the possession of deposits of clay which, mixed with sand or gravel, makes an excellent surface for roads, costing much less than macadam, yet possessing practically as much durability. This clay is found in many sections of the county right alongside the road upon which it is to be used, and, indeed, it frequently occurs in cuts made in bringing the road to grade, sufficient being taken from a cut to surface the road for a considerable distance. Properly graded, well-founded, then surfaced with this clay and sand or gravel mixture, the road, with such care in the way of "dragging" as every road must have to keep it in condition, will last for a number of years, and if mended from time to time, when it becomes worn, will be practically perpetual.

As the crowning glory of the improved road system of Muscogee county must be mentioned the drains, culverts and bridges. The commissioners have adopted the rule of ample waterways, and these have been provided along all the lines of road. The large culverts are of concrete and the bridges

are reinforced concrete or modern steel structures, and all are ample for all demands in both size and stability. For small culverts, concrete pipe is used, and this is made under the direction of the road engineer by the men in his charge.

The road work is done by convicts, of whom the county receives a number from the State, their only cost being their keep, while others are county prisoners who have been convicted of misdemeanors.

In addition to its good roads Muscogee county offers numerous other inducements to those desiring to change their locations. It has a climate that

is mild, healthful and delightful at all seasons. Its lands are highly productive of the grains and grasses, of truck, melons, peaches and other fruits. It is in a section peculiarly adapted to the growing of stock, the business of dairying and poultry raising.

Its most important city, Columbus, has seven lines of railroad and a navigable stream, the Chattahoochee River, upon which three lines of steamers ply, carrying the city's commerce to the Gulf of Mexico.

There are in the city eighteen cotton mills, three iron foundries and machine shops of large capacity and wide trade, three showcase and picture factories, and dozens of other industrial plants that give employment to labor at remunerative wages. It has an ample supply of hydro-electric power for sale at prices favorable to manufacturing.

There are throughout the county excellent schools, and in the city a system of education that begins with a free kindergarten and ends with a first-class high school and an excellent industrial school, where boys and girls are given instruction in various kinds of industries that prepares them for making a living with their hands. This industrial school is one of the most unique and successful in the United States.

The city of Columbus has sound banks, substantial wholesale houses and many modern stores, furnishing excellent shopping facilities.

Columbus and Muscogee county are, in short, a prosperous and progressive city and a prosperous and progressive county, whose varied opportunities await the man of enterprise and intelligence who is looking for a home or a business location, and where hospitable treatment and neighborly welcome and encouragement will be given all those who come in the spirit of friendship and with the desire to become one of the country's own people. The management of county affairs is typical of the whole situation. A county that can build and maintain fine roads and public buildings without bonds or indebtedness is the place to study and investigate.



THE EFFECT OF GOOD ROADS IN MUSCOGEE COUNTY, GEORGIA.

Hauling twelve bales of cotton to market with two mules.

# A Hydro-Electric Center of Exceptional Possibilities: Columbus, Ga.



**A**MONG the hydro-electric developments that are having marked influence in the prosperity of the South, those of the Columbus Power Co., at Columbus, Ga., are notable, both by reason of the power already developed and capable of being developed, and because of the uses to which it is being put and its consequent effect in building up the industrial interests of the section.

The Columbus Power Co. was organized in 1906 and took over the water-power development at North Highlands, built in 1900, and secured the excess power from the City Mills Co.'s development, being within the city limits of Columbus. The development at North Highlands is 12,000 horse-power, the amount secured from the City Mills Co. is 1200. The company also acquired the available undeveloped water-power rights between Columbus and Riverview, a stretch of some 27 miles, covering a fall of several hundred feet, and embracing locations for at least four developments. The first of these, completed late in 1912, has been put in at Goat Rock, 15 miles above Columbus. The dam and power capacity is 40,000 horse-power, but only 10,000 is installed as yet, the remainder being held in abeyance until needed.

Power is being delivered in Columbus to all but one of the even dozen cotton mills there, and to a large majority of the other manufacturing plants as well. In fact, the proportion of industrial concerns with electrically-driven machinery is so large that Columbus is known far and near as the "Electric City." A noticeable feature of Columbus is its smokeless smokestacks, silent witnesses to the economy and efficiency of electric power bought ready-made as compared with power generated by the individual plant.

Since the completion of the Goat Rock development transmission lines have been constructed to other nearby towns—West Point, Newnan, Lagrange, Hogansville and Grantville—to some of which power is now being delivered, and to all of which it will be carried soon.

Columbus has long been an industrial city of more than local importance, and the manufacture of cotton has been a leading business. Even before 1860 it was a cotton manufacturing and machinery-making center. It is therefore of interest that within the past year the number of spindles here has been increased 35 per cent. and the number of looms 39 per cent. This increase has been made by mills already in operation—the strongest possible tribute to the advantages of this city.

Numerous causes combine to make Columbus an attractive location for manufacturing concerns. It is situated on the western border of Georgia, about midway between its northern and southern extremities, where the climate is equable, being neither very warm in summer nor very cold in winter; the elevation is high, some 250 feet in the main part of the city, and rising rapidly on three sides; it is noted for its healthfulness. It is in the midst of an excellent farming section, whose lands yield prolifically of staple crops, as well as fruits and all vegetables known to the table; of lands unexcelled for dairying purposes, for poultry and the growing of live-stock generally. These things combine to make the best living conditions—good health and all the necessities of life at moderate cost—and they have their effect in winning to Columbus, and holding there, a class of labor of a better quality than is usually encountered in manufacturing towns.

Raw materials of many kinds can be easily assembled here—cotton comes uncompressed from contiguous fields, lumber from nearby forests, clays of various kinds from convenient beds, stone from close-surrounding quarries, iron from the Birmingham district a hundred and fifty miles away—these and others can be cheaply carried to meet cheap power at Columbus.

As a distributing point this city possesses advantages equaled by few. Within a few hours of half the population of the country, it is in the midst of the portion that is growing most rapidly in population and purchasing power. It has seven railroads, giving it, with their connections, easy entrance into every center of trade and population in the country. A belt line road connecting all these railroads makes the local handling of freight extremely easy.

In addition to its railroads, Columbus has water transportation, the Chattahoochee River being navigable for steamers from its wharves to the Gulf of Mexico, several boats being kept busy throughout the year. The improvement of this river by the Government—one of the certainties of the future—will make Columbus an important point in the waterways system of the South.

Eligibly located factory sites can be secured at comparatively low cost, lying convenient to belt line, railroad or river.

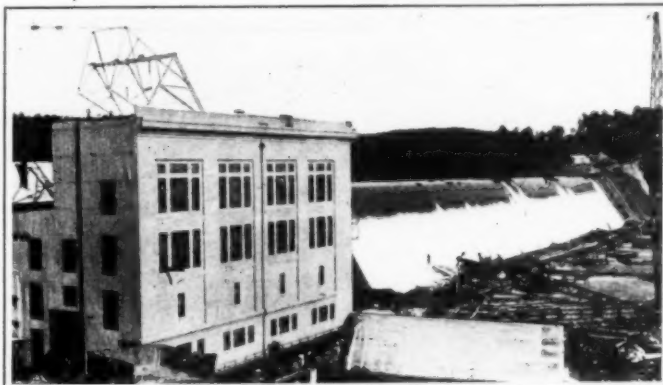
Columbus, therefore, offers cheap power, easily assembled raw materials, unexcelled transportation facilities, good living conditions, and, consequently, excellent labor.

In addition to the cotton mills are six fertilizer factories, iron works that manufacture ice machines, agricultural implements and many other articles, and ship abroad as well as throughout this country; a big wagon factory, two large flour mills, and plants that make barrels, bedspreads, boxes, cotton gins, awnings, bicycles, brick, iron castings, cane presses, office fixtures, showcases, burial caskets, engines, sash, doors and blinds, rope, shirts, brooms, mattresses, syrup kettles, clothing, carpets, cottonseed products, chairs, crates, cigars, woolen goods, mantels, etc., the total number reaching close to one hundred.

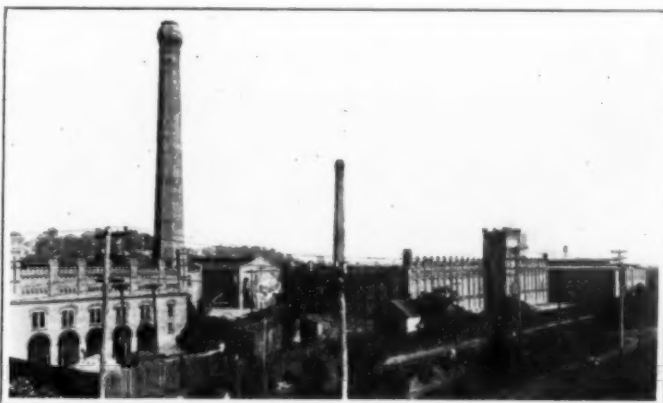
Excellent opportunities exist for other plants in many of the lines mentioned, and those to manufacture boilers, shoes, brass fittings, cars, car wheels and axles, cotton bagging, cottonseed oil machinery, furniture, grinding and polishing machinery, knit underwear, locomotives, machine tools, mining machinery, cotton mill machinery, railway equipment, pottery, phosphate machinery, soap, paints, neckwear, stoves, terra-cotta, ventilators, shuttles, spools and bobbins, tanks, trunks and bags, twine, wheelbarrows, webbing, woodenware, steam fittings, spokes, handles, butter, cheese, and many other things of universal use and for which there is a constantly increasing market.

Those wishing to establish such plants will find the business men of Columbus and the citizens generally ready to lend aid and encouragement to all legitimate enterprises. All things considered, there is no city that offers such concerns more advantages.

The Columbus Railroad Co., operating an excellent electric street railway line, secures its current from The Columbus Power Co. Both the power company and the railway company, though separate and distinct organizations, are Stone & Webster enterprises, being controlled by and operated under the direction of that great financing and engineering corporation, a fact that serves as a guarantee of thorough and unsurpassed service.



DAM AND POWER-HOUSE.  
Goat Rock Development. Columbus Power Co. Ultimate capacity, 40,000 H. P.



HAMBURGER COTTON MILLS.  
10,000 spindles, 276 looms, using 400 H. P.



SWIFT SPINNING MILLS USING 650 H. P.  
12,700 Spindles.

COLUMBUS MANUFACTURING CO. USING 2500 H. P.  
65,000 Spindles and 3000 Looms.





COLUMBUS POWER COMPANY'S DEVELOPMENT AT GOA ROCK OF

## The Hardaway Contracting Company

### A Record of One of the South's Big Development Institutions



AMONG the instrumentalities utilized in working out the development of the South the Hardaway Contracting Co. of Columbus, Georgia, holds a prominent place by reason of the great number of contracts it has executed, their relative importance, and the wide scope of country over which they have extended, no less than because of its unsurpassed equipment for handling large contracts, and especially for doing the construction work for hydro-electric developments. So well has its fitness for doing this class of work become known that its services are in constant demand, and B. H. Hardaway personally and the preceding companies in which Mr. Hardaway has been a partner have probably executed three-fourths of such work done in the Southeastern States during the past dozen or fifteen years.

B. H. Hardaway, who has been in the contracting business for more than twenty years, finally found it assuming such proportions that he thought it advisable to incorporate it and take in with him men who would help him carry the burden of responsibility. In April, 1911, a charter was secured and the Hardaway Contracting Co. was organized with B. H. Hardaway, president; O. C. Bullock, first vice-president; T. A. Jamison, second vice-president; S. S. Scott, third vice-president; W. G. Cotton, secretary and treasurer. These, with the addition of R. L. Pearson, superintendent, and H. N. Hood, engineer, are the directors of the company also, and the only holders of its stock. The men Mr. Hardaway thus associated with him, with the exception of O. C. Bullock, president of the Merchants and Mechanics' Bank of Columbus, have been in his employ for varying periods, and each is an expert in his particular line of work. Recently Mr. Jamison was made general manager, the office of traffic manager was created, and G. H. Whitaker, an experienced railroad man, was chosen to fill it. The capital stock of the company is \$200,000, and it began with \$50,000 surplus. Its surplus and undivided profits now approximate half a million dollars.

Following is a partial list of the company's equipment:

Forty 20-ton steel derricks, with masts 115 feet and booms 100 feet, each operated by a new 40-horse-power hoisting engine; 20 locomotive engines and standard steel flat cars of 100,000 pounds capacity; a line of gyratory rock crushers, varying in size from one taking a 42-inch stone to one that takes only a 15-inch; sand rolls and incidental equipment of every character designed to facilitate the work of which the company makes a specialty.

The Hardaway company now has on hand and in process of execution the following contracts:

Columbus Power Co., Columbus, hydro-electric development on Chattahoochee River; Stone & Webster Engineering Corporation of Boston, Mass., engineers; J. L. Brown, Boston, main superintendent; George F. Harley of Sparta, Ga., resident engineer. The dam is 63 feet high. The work involves

140,000 yards of masonry. Ultimate power development, 40,000 horse-power. Value of company's equipment on this work, \$240,000. This contract is completed all to moving the construction equipment.

Georgia Power Co. and Northern Contracting Co., Atlanta, Ga., hydro-electric development on Tallulah River, Georgia. In this contract there are two dams and two power-houses. Charles O. Lenz, New York, engineer; Charles Adsit, Tallulah Falls, Ga., resident engineer. The work involves 110,000 yards of masonry, and the development will be 95,000 horse-power. The company is using on this contract \$100,000 worth of equipment.

Southern Aluminum Co., Whitney, N. C., completing hydro-electric development on Yadkin River. P. Bunet, chief engineer; Piere Berges and Louis Rozé, Paris, France, assistant engineers; W. P. Marseilles, Whitney, N. C., general manager; D. F. Campbell, London, England, resident engineer. This development will be 40,000 horse-power. Amount of masonry not yet determined. Value of company's equipment on this contract, \$80,000.

United States Government in improvement of navigation on Black Warrior River at Squaw Shoals, near Tuscaloosa, Ala. This work consists of three locks and two dams, numbers 16 and 17. Major C. A. F. Flagler, corps of engineers, Mobile, Ala., engineer; George K. Little, Tuscaloosa, Ala., assistant engineer; John B. Battle, superintending engineer; Sam Jones, resident engineer, Squaw Shoals, Ala. This work involves 317,000 cubic yards of masonry. The equipment used by the Hardaway company on these contracts is valued at \$500,000. It consists of a 2000-horse-power steam plant, compound condensing; 12 locomotives, 20 steel derricks of 20-ton capacity each, three air compressors of 2500 cubic feet capacity per minute, one No. 21 crusher, which weighs 485,000 pounds and takes a 42-inch stone; six No. 5 crushers, four sand rolls, two two-yard cube mixers, a belt conveyor, which carries cement from storage-house to mixer platform. The crusher plant is driven by a 720-horse-power Corliss engine. Seventeen miles of railroad were built to the site of these locks for purposes of construction, two miles of it being over a 6½ per cent. grade.

City of Columbus, Dillingham street bridge over the Chattahoochee River, consisting of five spans of 128 feet each. Thatcher & Meuser, New York, consulting engineers; W. C. Campbell, Columbus, engineer for city; C. H. Johnson, Columbus, resident engineer. This work involved 17,000 cubic yards of masonry. The Hardaway Contracting Co.'s equipment on this contract is valued at \$20,000.

Some of the completed contracts executed by the Hardaway Contracting Co., B. H. Hardaway personally, and various firms in which Mr. Hardaway has been interested, are given here:

Anderson Water, Light & Power Co., Anderson, S. C.; a hydro-electric development on Seneca River. W. C. Whitner, Rock Hill, S. C., engineer. There



DILLINGHAM STREET BRIDGE ACROSS THE CH



ROCK ON THE CHATTAHOOCHEE RIVER.

was 8000 cubic yards of masonry involved in this contract, which was executed by Watkins & Hardaway.

Winston-Salem Power Co., Winston-Salem, N. C., a hydro-electric development on Yadkin River in North Carolina. William R. Makepeace, Providence, R. I., engineer. Development, 2000 horse-power; involved, 6000 cubic yards of masonry. Work done by Watkins & Hardaway.

Tallassee Falls Manufacturing Co., Tallassee, Ala., a hydraulic development on Tallapoosa River. William R. Makepeace, Providence, R. I., engineer. The development was 10,000 horse-power and required 40,000 cubic yards of masonry. Watkins & Hardaway were the contractors.

Columbus Power Co., a hydro-electric development on the Chattahoochee River at Columbus. W. C. Whitner, Rock Hill, S. C., and W. S. Lee, Charlotte, N. C., engineers. Development, 10,000 horse-power; amount of masonry involved, 25,000 cubic yards. Contract executed by Hardaway, Jones & Co.

Washington Mills Co., Fries, Va., a hydraulic development on New River. William R. Makepeace, Providence, R. I., engineer. Development, 8000 horse-power, and involved 40,000 cubic yards of masonry.

Georgia Power Co., Atlanta, Ga., hydro-electric development on Chattahoochee River near Atlanta. John Bogart, New York, and William H. Cushman, New York, engineers. Development, 17,000 horse-power; involved 60,000 cubic yards of masonry. Contract executed by Smith & Hardaway.

West Point Manufacturing Co., West Point, Ga., a hydraulic development on Chattahoochee River at River View, Ala. A. H. Frazier, West Point, Ga., engineer. Contract involved 4000 cubic yards of masonry.

City Mills Co., Columbus, hydraulic development on Chattahoochee River at Columbus. H. K. Hood, Columbus, engineer. Development, 4000 horse-power; work involved 16,000 cubic yards of masonry.

Albany Power Co., Albany, Ga., hydraulic development on the Kinchefoonee. J. E. Sirrine, Greenville, S. C., engineer; W. D. Dent, resident engineer. Development, 3000 horse-power; contract involved 22,000 cubic yards of masonry.

Clifton Manufacturing Co., Spartanburg, S. C., hydro-electric development on Pacolet River. William R. Makepeace, Providence, R. I., engineer; Frank A. Peirce, Columbus, Ga., resident engineer. Development, 3000 horse-power; contract involved 10,000 cubic yards of masonry.

Southern Power Co., Charlotte, N. C., hydro-electric development on Broad River, near Blacksburg, S. C. W. S. Lee, Charlotte, N. C., vice-president and chief engineer; C. A. Mees, Charlotte, designing engineer; J. G. Scott, Charlotte, resident engineer; G. L. Winthrop, Anderson, S. C., assistant engineer. Development, 17,000 horse-power; masonry involved, 160,000 cubic yards. The masonry on this work was all placed within one year, 22,500 cubic yards having been placed in one month.

Southern Railway Co., bridge across Tennessee River near Chattanooga, Tenn. William H. Wells, Washington, D. C., engineer; Robert Lacy, Baltimore, Md., resident engineer.

Atlanta, Birmingham & Atlantic Railway Co., bridge across Coosa River. Alex. Bonnyman, Atlanta, Ga., engineer.

Seaboard Air Line Railway Co., bridge across Chattahoochee River near Atlanta, Ga. J. W. Bushnell, Tallahassee, Fla., engineer.

Savannah, Americus & Montgomery Railway Co., bridge across Chattahoochee River near Omaha, Ga. R. E. Hardaway, El Paso, Tex., engineer.

Apalachicola Northern Railway Co., bridge across Apalachicola River at Apalachicola, Fla. William Hunicke, Jacksonville, Fla., engineer. Work included steel bridges at St. Marks and East rivers; drawbridge and trestle approaches five miles long across Apalachicola River.

Georgia, Florida & Alabama Railway Co., bridge across Flint River at Bainbridge, Ga. R. E. Hardaway, El Paso, Tex., engineer.

Mobile & Ohio Railroad Co., bridges across Black Warrior, Sipsey and Cahaba rivers. R. E. Hardaway, El Paso, Tex., engineer.

City of Columbus, bridge across Chattahoochee River at Fourteenth street. Robert Johnson, Columbus, engineer.

Seaboard Air Line Railway Co., bridge across St. Marys River in Florida. W. S. Greene, Alexandria, Va., engineer.

Florida East Coast Railway Co., bridge across St. Lucie River near Palm Beach, Fla. E. Ben Carter, St. Augustine, Fla., engineer.

With an organization welded together by twenty years of constant effort, consisting of five distinct units, each under command of superintendents and foremen of from fifteen to twenty years' experience, and with an equipment that embraces all that is best in modern machinery and appliances, the Hardaway Contracting Co. has no hesitancy in undertaking any contract, no matter how large, confident that it can complete it in any reasonable time that may be designated, and to the entire satisfaction of those desiring to have the work done. The company takes contracts on any basis desired by owners, but prefers to make them on a straight yardage basis.

The Hardaway Contracting Co. is the final expression of the business career of B. H. Hardaway, its president and controlling spirit. Mr. Hardaway is a man of large affairs and one who holds the confidence of his fellows to a remarkable degree. It is a matter of great personal pride with him that in twenty years of contracting work, running into millions of dollars, he has never been involved in a lawsuit in order to secure a settlement, and has never failed to execute a contract when undertaken. The natural consequence of his character for honest work and fair dealing is that those for whom the Hardaway Contracting Co. once executes a contract are always anxious to engage its services for future work, while those who know it by reputation stand ready to trust it with anything they have to do. These are the things that have operated to increase the business of this company until it has grown from one to five distinct, well-equipped units, able to carry forward five contracts at the same time, and to give to each the benefit of rapid work and superior skill. Mr. Hardaway and the Hardaway Contracting Co. have dealt with only the best companies, and have been connected with developments of only the most sterling worth. In spite of his business activities, Mr. Hardaway has always found time to give attention to the civic duties that devolve upon the good citizen, and he is now one of the commissioners of Muscogee county, a body that has done broad work in putting that county on a sound and substantial basis. He brings to the service of the people the same earnestness and sincerity, the same fairness of mind and equipoise of character that have brought him such distinguished success in his private business undertakings.



THE CHATTAHOOCHEE AT COLUMBUS, GA.



# Macon, Georgia: A Beautiful, Well Governed and Highly Attractive Municipality



MACON, GEORGIA, now fast closing its first century of existence as a municipal entity, occupies a beautiful position upon the Ocmulgee River within two miles of the exact geographical center of the State, and within a 50-mile radius of a population of 700,000 people. The original city plot was laid off with great engineering skill and with a liberality respecting land that was all unstinted. The consequence is broad, straight streets, edged with sidewalks proportionately wide. Many of the streets are centered by parkways, with wide strips of green sward, bordered by trees, and with driveways of sufficient width on either side. Built upon land that rises rapidly as it leaves the level river bottom until it carries to a considerable eminence in the chief residence section, the city is in physical features one of the most attractive to be found anywhere. In addition to these there are many other features that combine to give Macon a peculiar charm as a residence city.

It has long been the seat of a number of educational institutions of high standing that have been so extensively patronized by local people that the entire life of the city radiates an atmosphere of education and intellectual refinement that has its influence upon all classes. The educational system now consists of public schools that run from primary grades through the grammar schools and a high school with a course of instruction that prepares the pupil for entrance to the best colleges, supplemented by Mercer University and by St. Stanislaus, a Catholic college for boys, and Wesleyan Female College and Mount de Sales, a Catholic college for girls—all schools of high character. Wesleyan College is the oldest chartered college for girls in the world, and enjoys as well the distinction of being especially well conducted. Hundreds of the graduates of these schools are found in the citizenship of Macon, a fact that speaks for itself in the class of men and women who give character to the city in its business and social relations.

Another important feature of the city's educational system is comprised in two night schools in the factory districts, where the rudiments of education are put within the reach of many who would not otherwise have the opportunity to enjoy them. These schools are well attended, and even a number of grown persons, deprived by circumstances of earlier opportunities for attending school, have there been taught to read and write. As still further broadening its general scheme of education, the city helps to maintain two free libraries to which access may easily be had. One of these, the "Price Free Library," named for the Mayor during whose administration it was established, is unique. Of its several thousand volumes, 2500 were donated by their authors, most of them being accompanied by their autographs. Practically all the books are by American authors, and the library was founded with the idea of making it appeal especially to working people. This library started in the late nineties, is housed in a building donated by T. J. Carling, one of Macon's enterprising citizens. For the maintenance of this and the City Library the city of Macon and the county of Bibb each appropriate a certain sum each month.

For the health and happiness of the young Macon maintains three playgrounds in as many sections of the city. The largest of these, known as "Tatnall Square," covers 16 acres, is eligibly situated, and is a popular place of recreation and amusement for the children living in the neighborhood. The other grounds, though smaller in size, are no less popular.

Other institutions maintained by the municipality are a "Home for the Friendless," where certain classes of the indigent are cared for until such time as they can care for themselves, and the "Travelers Aid," which keeps matrons at the various passenger stations, ready to look after such travelers as need their care. Both these institutions have proven of great benefit upon many occasions. A handsome and commodious Y. M. C. A. building, thoroughly equipped and well managed, serves the excellent purpose for which it was built, that of furnishing clean entertainment and helpful influence for the young men of the city who seek its portals.

The municipal government of Macon has for the most part been in good hands, and the city has much to show for the money expended by its various administrations. It has 20 miles of well-paved streets and 50 miles of sewers, a market-house right in the heart of the city, and a handsome city hall building that embraces council chamber, offices for the various departments of the municipal government, including the water-works commission, police court and police barracks, and an auditorium that seats 2500 people. The building itself is a handsome structure and is so situated that it presents a stately and attractive appearance. With its outlines marked in electric-light bulbs, it constitutes at night one of the show places of the city. Among other assets is a fire department as well equipped, possibly, as that of any city in the country, regardless of size. Macon was the first city in the South, and perhaps in the country, to have a fire department equipped throughout with auto-trucks. This equipment was completed within the past three years.

Possibly no other city in the country has so complete a system of fire alarms and police calls. The wires for these are all under ground, and the central station for both systems is in the city hall building. There the operator not only receives and transmits all fire alarms—the system thus set at work apprising each fireman of the existence of a fire, and, if it be at night, lifting the cover and the mosquito bar from his bed—but calls to the nearest call station at any hour of the day or night any particular police officer with whom it is desired to communicate. In case the chief wished to communicate with all the officers on duty at the same time they could be summoned instantly, each to the call box nearest him, and there spoken to all together by the chief sitting in his office. The value of such a system in case of riot,

when it is desirable to mass the entire force at a single point, can be readily seen. It is the invention of C. H. Humphreys, city electrician.

The city of Macon owns the water-works that furnish the water for domestic and other consumption. The plant was purchased during the summer of 1911, when a bond issue of \$900,000 was voted, \$700,000 for the purchase and \$200,000 for the improvement of the plant. The plant is operated and controlled by a board of commissioners elected by the people for that purpose, and not connected with other departments of the municipal government. Prices are so arranged that a sufficient income is assured to pay running expenses and interest on the bonds and to provide a sinking fund that will pay them off at maturity. In spite of this tax the commissioners have been able to decrease the price of water to consumers from 30 cents to 20 cents per thousand gallons. The supply of water is taken from the Ocmulgee River, and an excellent filtration plant renders it clear and practically pure before it is pumped into the mains. The supply is large and the pressure ample.

At an assessed value of three-fourths the actual value, Macon has taxable property amounting to \$30,000,000, allowing a bonded indebtedness of \$2,100,000. Outside of the \$900,000 indebtedness incurred in the purchase of the water-works, which must care for themselves, the city's outstanding bonds are but \$490,000, leaving a capacity for bonding of more than a million and a half, should occasion arise for the use of the money. The tax rate is \$1.25, of which, under the laws of the State, one-eighth must be used each year for street paving. Financially, therefore, the city is in excellent condition.

In few cities are the residence districts built up with such handsome and imposing homes as in Macon. In some sections the colonial style of architecture prevails to such an extent that many squares are filled with stately mansions of that character, with beautiful well-kept lawns, rendering such streets surpassingly attractive. Other styles prevail in other sections, but the general character of dwellings throughout the city is far above the average. The hospitality of these homes is as generous and substantial as the houses themselves are beautiful.

The social life of the city is delightful in the extreme—refined, intellectual, elevated in tone. It has as assets in this line, in addition to its homes, a number of social clubs and other organizations. The Idle Hour Country Club, which has beautiful grounds near the city, including a golf course, is about to build a \$25,000 clubhouse that will be a great addition to the social life of Macon.

Handsome church edifices abound in the city, representing practically all the leading religious denominations.

There are numerous good hotels, the list being headed by the Dempsey, a thoroughly modern hostelry just opened to the public. It is a ten-story fire-proof building, handsomely fitted and furnished, and was built by a stock company composed of the leading business men and capitalists of the city.

Macon is surrounded by an agricultural section not anywhere surpassed for the abundance and variety of its products. Its lands produce cotton, the grains and grasses, truck crops of every kind, and practically all the fruits found north of the sub-tropical zone. It is almost at the heart of the great peach section that has made Georgia famous, and within the radius of production of the Georgia watermelon and canteloupe, well known in all markets. It has an excellent local market, and the best of all edibles can be secured there at prices much lower than those prevailing in most other places.

Six railroads have tracks reaching into Macon, and over these a number of others run their trains into the city, furnishing facilities for reaching every portion of the country with ease. The Ocmulgee River, navigable to that point, furnishes another ready means of transportation. Good roads lead from the city limits into all sections of the surrounding country. A handsome passenger station, for which the Central of Georgia Railway has appropriated about \$1,250,000, is soon to ornament the city and add to the comfort and convenience of the traveling public. It is probable that the Southern Railway will also build a handsome passenger station at an early date.

Three military companies, to the financial support of which the city contributes, are among its cherished possessions. One of these owns its own armory building. An excellent theater building, in which numerous good companies appear each season, adds its quota to the city's attractions as a place of abode, and two well-conducted daily newspapers help to round out its metropolitan character.

An electric street railway system furnishes easy communication to all parts of the city and reaches into various suburbs, the streets are beautifully lighted with electric lights, and in the homes there is the choice of gas and electricity.

A successful State Fair, held in Macon the latter part of October, brings to the city many thousands of visitors each year.

In the matter of health Macon occupies second place among American municipalities, and its standing has never been lower than third. The average temperature is 63, and few winters see the mercury drop below 37. The mean annual rainfall is 47 inches, and there is practically no snow. Macon's elevation is 318 feet above sea level.

Being so close to the geographical center of the State, and the center of its greatest population as well; with unsurpassed facilities for reaching every portion of the State, and of being reached from every portion, the people of Macon believe their city should be made the capital of Georgia, and to that end have been carrying on a campaign of education for the past several years. Backed by substantially the whole of South Georgia, and by a considerable portion of the territory lying north of Macon, they have found much to encourage them, and will put forth still more strenuous efforts in the future.

# Macon, Georgia: A City Presenting Many Opportunities for Commerce and Manufacturing



COMPLEMENTING those features, set forth on the preceding page, which render Macon so conspicuously desirable as a place of residence from the standpoint of physical beauty and social and intellectual environment, the city offers inducements for business in many lines seldom duplicated and never surpassed.

Situated in that part of Georgia most thickly peopled, and with 700,000 of the State's population living within a radius of 50 miles from its gates, it presents opportunities and advantages for those desiring to engage in commercial pursuits or industrial undertakings that are worth careful study.

In the matter of transportation, one of the first things to be considered in connection with a city's availability for business, Macon is well provided. It has six railway lines running in on their own tracks from many directions. These are the Southern, with lines to Atlanta, Brunswick and Jacksonville; the Georgia, with its line to Augusta; the Macon & Birmingham, to Lagrange; the Macon, Dublin & Savannah, to Dublin and Savannah; the Georgia Southern & Florida, to Jacksonville and Palatka, Fla.; the Central of Georgia, to Atlanta, Athens, Savannah, Albany, Montgomery and Birmingham. Nine branch roads run their trains into the city over these tracks, giving it in effect fifteen lines of railway. The freight carried in and out of Macon in the course of a year by these roads totals approximately 2,000,000 tons. By way of the Ocmulgee and Altamaha rivers the city also has water transportation to Brunswick, an important seaport, and intervening river points. These lines of transportation serve to give Macon easy access to the raw materials abounding in many fields, and to give it direct connection as well with the principal markets of the country and the centers of commerce and population, making it eligible both as a place of manufacture and a point for distribution.

The raw materials lying in close proximity to Macon, and easily and economically assembled there, are cotton from the fields on every hand; timber, embracing the long-leaf yellow pine, the numerous hardwoods from the river bottoms, and cypress in unmeasured quantities from the nearby swamps; kaolin from the rich deposits of many surrounding localities; clays adapted to the making of brick, sewer pipe and numerous other articles of like nature.

Added to transportation facilities and accessible raw materials is the cheap and convenient power which Macon has. This is furnished by the Central Georgia Power Co., a company composed of local men, which has recently built a dam across the Ocmulgee River near Jackson, Ga., and installed the machinery necessary for a hydro-electric development of 24,000 horse-power. Current from this development is carried to Macon over transmission lines and there delivered to such manufacturing plants as find it desirable.

Macon has long been a manufacturing center of something more than local importance, and now has an annual manufactured output of \$18,669,000 value. The articles manufactured embrace cotton goods, cottonseed products, leather, harness, kaolin, brick, sewer pipe, lumber, engines and boilers, fertilizers, foundry products, machinery of various kinds, sash, doors and blinds, boxes, crates and hampers, and numerous other articles of general use. The manufacturing plants number 86, and they give employment to 4840 people, to whom are paid wages totaling \$2,221,000. The raw material used is valued at \$14,035,000, to which a value of \$4,634,000 is added in the process of manufacturing. The capital invested is \$8,762,000. The growth of Macon's manufacturing business since 1899 is shown by the following figures:

Year.	No.	Employees.	Wages.	Material.	Output.
1899.....	66	3,202	\$895,000	\$3,151,000	\$5,452,000
1904.....	61	4,000	1,558,000	4,116,000	7,297,000
1909.....	80	4,150	1,854,000	6,869,000	10,703,000
1912.....	86	4,840	2,221,000	14,036,000	18,669,000

The city has a good supply of good labor. Having been a manufacturing city for many years, there is a large factory element, trained to that class of work that makes it much easier to conduct the manufacturing business there than in a community lacking such an element. The labor is white, intelligent and easily controlled. Owing to the comparative cheapness of living, because of the mild climate and the low cost of most of the necessities of life, wages are something lower than must be paid for labor of the same class in cities less favored by natural conditions.

There are excellent openings in Macon for other manufacturing enterprises, including those making knit goods, shirts, overalls, trousers, shoes, cotton bagging, furniture, stoves, wood novelties, various kinds of cotton goods, etc.

Macon is a jobbing center of considerable importance, and a considerable number of traveling men carry the trade of her wholesale houses throughout a wide expanse of territory. There are houses there doing wholesale business in dry-goods, notions, shoes, hats, drugs, hardware, groceries, candies and crackers, produce and harness. Their combined annual business runs between \$15,000,000 and \$20,000,000 and is being rapidly increased. There are openings for other jobbing-houses to engage in various other lines, and even in some of those mentioned above, as the tributary country is growing rapidly in population and purchasing power and the distributing facilities possessed by Macon render it peculiarly fit as the location of such enterprises.

In the matter of banking facilities, vastly important to manufacturing and jobbing interests, Macon is well supplied, both as regards the financial strength of its banking-houses and their liberality in protecting worthy local enterprises. Of national and State banks there are thirteen and of trust companies two in the city. Their combined capital is \$3,602,000; surplus and profits, \$2,283,096.98; deposits, \$8,357,112.88; total resources, \$14,242,209.86.

The city has a private bank, also, that does a large business, which is not included in the above.

The total bank clearings in 1912 were \$212,292,211.44, an increase from \$35,460,489.49 since 1908.

The postoffice receipts in 1912 were \$171,781.82.

The growth of Macon has been steady and continuous since its foundation in 1823. When the Civil War began it had about 8000 people, in 1870 it had 10,810, in 1880 it had 12,749, in 1890 it had 22,746, in 1900 it had 23,272 and in 1910 it had 40,665. The growth since 1910 has been very rapid, and it is estimated that the city now has a population approximating 48,000. The city embraces an area of eight square miles.

The Central of Georgia Railway maintains in Macon railroad shops among the largest in the South. These shops cover a large area with their various buildings, and are fitted up with all the latest and most improved machinery for building and repairing locomotives and cars and such other articles of railroad equipment as are of every day use in keeping up a great railway system. The main shops of the Georgia Southern & Florida and the Macon, Dublin & Savannah are also in Macon, as are the division shops of the Southern. These railway shops give employment to some 2000 men and distribute in wages hundreds of thousands of dollars annually.

Macon lies in the midst of a rich agricultural region, where the combination of soil, climate and rainfall conduces to the production of large crops, and the yield of cotton, corn, oats, wheat and the various hay and forage grasses is large. The soils of this section are largely sandy and sandy loam, and it is the latter kind that produces such large general crops. The lands are well watered by numerous rivers and creeks, and the annual rainfall, averaging 47 inches, well distributed throughout the growing season, makes droughts practically unknown. The lands are generally level and smooth, a large proportion of them being susceptible of easy cultivation. This section is not only prolific in the production of cotton and the ordinary field crops, but it yields abundantly of truck and vegetables as well. Potatoes are a sure and profitable crop, and while the average potato yield for the entire State is \$81 per acre, in the Macon section yields of \$150 and \$200 are not uncommon. Many other trucking crops yield even more profitably. This is the famous melon section of Georgia, whence are shipped to Northern markets each year hundreds of carloads of watermelons and canteloupes.

But a few miles to the southwest of Macon is the center of the greatest peach-producing section of the State, with its thousands of acres set in millions of trees. Thousands of carloads of fruit are shipped from these orchards to the markets each year, a large proportion of which pass through Macon, and many of Macon's citizens are financially interested in the orchard developments.

The long-growing season in this section makes feasible the growth of two or three crops annually from the same soil, and it is customary with many farmers to follow truck or early field crops with corn, and that in turn with cow peas, soy beans or some other hay or forage crop, the yield from each being equal to that obtained farther north, where only one can be grown in a year. This section of Georgia is well adapted to the growing of livestock of all kind and of poultry.

This rich surrounding country has naturally had great influence upon the general wealth and substantial prosperity of Macon, and there are few cities where the average of wealth is higher, or where prosperity is more generally diffused.

Macon has an excellent street railway system that furnishes quick transit to practically every part of the city and into some of the suburbs as well. It is extending its lines to meet the demands of the rapidly-growing population, and there are few cities anywhere with more convenient street-car service.

Good roads lead from Macon to all points of the compass, and every portion of Bibb county, of which the city is the county-seat, is easily reached by means of automobile or other conveyance. These roads are having strong influence in filling up the county with substantial farmers, and the business of agriculture is being greatly promoted thereby.

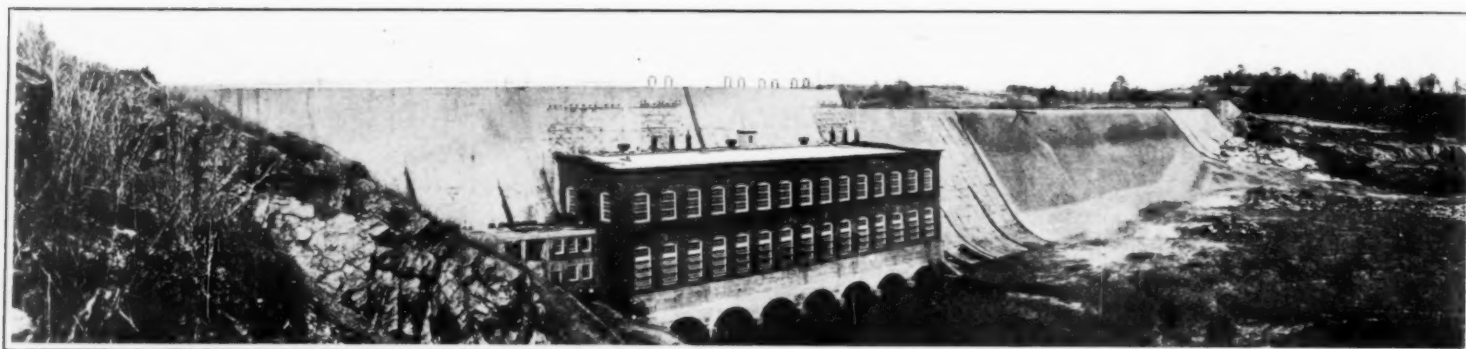
The best of agricultural, trucking and fruit-growing lands can be secured at very low prices, and in most instances upon terms that give the purchaser every opportunity to make the income from the soil meet interest and deferred payments. These are matters that have great attraction for a good class of settlers, and of such Bibb county and her nearby neighbors are receiving a continually increasing number.

Macon has never experienced a boom, but has enjoyed for a number of years a rapid, steady growth in both population and commerce, and is believed now to be in the enjoyment of its greatest era of advancement. Numerous influences are at work to combine its advantages into a militant force that will have for its object the great advancement of the city and its every interest, and her citizens stand ready to welcome all who come in good faith to help in that advancement and to partake of the even greater period of prosperity to be ushered in.

An active and aggressive Chamber of Commerce, with a membership embracing the city's most enterprising and progressive business men well-offered and equipped, is working diligently and intelligently for the upbuilding of Macon, and its efforts are bearing fruit in a broader and more comprehensive development along many lines.

The capitalist, the business man, the manufacturer, the artisan, each of these will find Macon a good place in which to live, to found his home and raise his family, to invest his money, conduct his business, or to labor with his hands.





DAM AND POWER-HOUSE OF CENTRAL GEORGIA POWER CO. ON OCMULGEE RIVER.

## Central Georgia Power Company and Its Ocmulgee River Hydro-Electric Development

**I**N these days of conservation of natural resources the question of generating power by means of hydro-electric development rather than by the use of coal through the medium of steam is one of importance almost paramount in the manufacturing and industrial world. The coal removed from the mine and used to turn water into steam, and that into an active principle expressed in watt or horse-power—every pound of coal so utilized is a pound of coal gone forever. To that extent a certain portion of the forces of nature has been destroyed, and can never be renewed. On the other hand, the water of many streams, as it tumbles down from mountain height to valley level, can be caught and harnessed to the mechanism prepared by the ingenuity of man and turned into power, and so used to turn the wheels of industrial plants and make factory spindles whirr without destroying any element of its strength or lessening in any degree the permanent supply. For as often as water runs its course to the sea it is taken up by the rays of the sun and returned to the clouds, thence to fall on mountain-side, to gather into rivulets that merge themselves into rivers, and so furnish again the power required by the needs of man, with no tittle of its potentiality wasted or destroyed, no matter how many times over it may be so used.

The economy embraced in the use of falling water for the development of power has been so thoroughly demonstrated, in so many places and so many ways, that there is no room left for discussion as to its merits in building up a manufacturing and industrial community. The savings in initial cost of plant, in fuel and in labor combine to render such power desirable, no matter the angle from which the matter may be viewed. Especially is it desirable in those communities so far removed from the source of fuel supply that the first cost of the fuel is swallowed up in the much greater cost of transporting it to the point of consumption.

The South is particularly rich in the abundance of its hydro-electric potentialities, the development of which will materially hasten the day when it will become a region of great manufacturing plants, where the natural resources of forest, field and mine will be fabricated into finished form before finding their way to other sections or other countries. Of the hydro-electric developments that are thus bearing such an important part in building up the manufacturing and industrial interests of various sections of the South, that of the Georgia Power Co. is more than ordinarily notable. This development is at the foot of Capps and Lloyd Shoals, eight miles from Jackson and forty miles north of Macon, where a dam of cyclopean construction has been thrown across the river. This dam is 1728 feet long and 100 feet high, and creates a reservoir 16 miles in length and covering an area of 4000 acres. The power-house equipment consists of Morgan-Smith water-wheels and Westinghouse generators of 3000 K. V. A. capacity, the total capacity of the plant being 24,000 horse-power.

The current is generated at 2300 volts and stepped up to 66,000 volts for transmission to neighboring towns and cities. The high-tension service is carried on double-circuit steel towers, provided with ground wires for protection against lightning.

The current is being delivered for power and lighting purposes in the cities of Macon, Jackson, Forsyth, Barnesville, Monticello, Griffin, Hampton, Jonesboro and Atlanta. At all these places transformer substations have been erected to provide lower voltage for local distribution. The service is being used in these various cities for the operation of municipal lighting plants, and to furnish power for running the machinery of cotton mills, cottonseed-oil mills, fertilizer factories, machine shops, breweries, railroad shops and many other kinds of industries.

The advantages accruing to a city

from the possession of unlimited quantities of cheap power has been recognized by the communities to which current is being delivered, and the company has received the hearty co-operation and support of the local boards of trade and other commercial bodies, with a view to stimulating industrial activities and encouraging the establishment of manufacturing plants.

The company owns a number of other power sites, located on the Flint, Oconee and Ocmulgee rivers, which will, when developed, give it an ultimate capacity of approximately 200,000 horse-power. These developments will be made as rapidly as the industrial progress of the section to be served shall provide a market for the power.

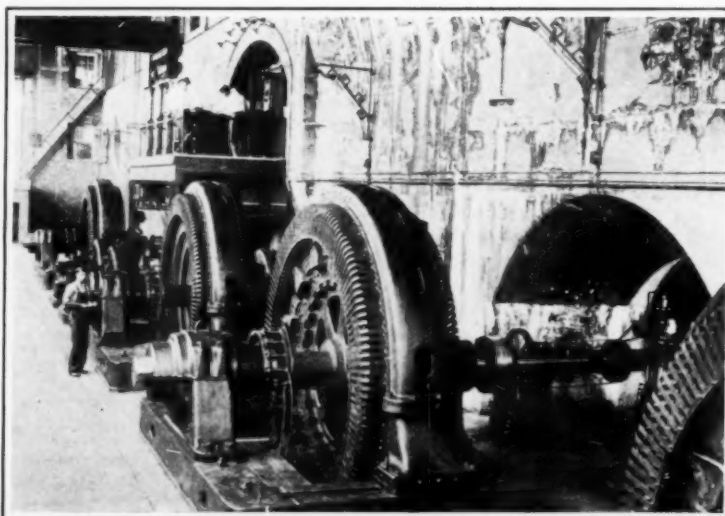
The cities served by the Central Georgia Power Co. lie in the richest and most populous part of Georgia, and present many attractive openings for the establishment of industrial and manufacturing plants. Some of them are within easy reach of great stretches of forest lands, where millions of feet of timber but await the coming of the axe and the saw to make them the foundation of great enterprises, bringing employment to labor and profit to capital. Furniture factories, sawmills, planing mills, barrel, box and crate factories, and other woodworking plants of various kinds could find profitable locations in some or all of these cities. As the economy of modern industrial life drives the cotton mills to locations near the cotton fields, the eligibility of these Georgia cities will become more and more impressive. Raw cotton grows all about them, and can be brought to the doors of their mills with a minimum cost for handling. Labor can afford to serve for a less wage than in Northern manufacturing cities, because the living conditions are better and the necessities of life are cheaper. The possession of plenty of cheap power rounds out the advantages to the full. For the manufacture of cottonseed products the same advantages exist, and for the manufacture of many other articles of daily use and consumption, the raw materials for which abound on every hand.

Each of these cities has good railroad connections, furnishing the means both for the convenient assembling of the raw materials and the economic distribution of the finished product. In short, there is probably no other section of like size in the entire country in which are to be found so many exceptionally eligible locations for manufacturing concerns of various kinds as in that portion of Georgia served by the current of the Central Georgia Power Co.

The company has its general offices in Macon, where it is closely allied with the companies owning and operating the street railway and electric-lighting systems and the gas plant. The street railway company has recently rebuilt its steam power plant, at which is developed 5000 horse-power. Macon is one of the most brilliantly lighted cities in the country, having a "white way" system of lighting covering forty blocks in the business district. A large proportion of the city's industries are being run by electric power secured from the Central Georgia Power Co. Few cities in the South have

shown a more uniform healthy industrial growth than Macon, where there is a wide diversity of manufactures and where there have been no booms and no setbacks. Its growth is typical of that of the richly endowed region of which it is the focusing point. With its river and railroad transportation facilities, its command of raw materials, its productive surrounding country yielding abundantly of grains, grasses and fruits, as well as cotton, Macon and the territory reached by the Central Georgia Power Company's lines should develop very rapidly.

The Central Georgia Power Co. is thoroughly equipped, its buildings and machinery are all modern, its managers experienced, capable and enterprising, and it is fitted in every way to economically develop and cheaply and reliably deliver power to its patrons.



INTERIOR OF POWER-HOUSE ON OCMULGEE RIVER.

# Augusta, Georgia

## A Southern City Traveling Full Steam Ahead



### **CHEAP** hydro-electric power.

Low freight rates, consequent upon water competition.  
A river navigable all the year around to the seaports.  
Remarkable climate and soil fertility.

These are the four factors that are fast making Augusta, Ga., not merely a progressive city, but one that bids fair to outstrip many of its competitors. It is an old city, but upon its conservatism have been engrafted modern ideas, the result being a combination that offers great attractions to the investor, the manufacturer, the homeseeker and the agriculturist from localities less fortunately situated climatically.

### **STRATEGICALLY SITUATED.**

Its strategic location at the head of navigation on the Savannah River—near one of the largest in the country aside from the continental dividers—has for nearly two centuries made it one of the principal cities of the Southeast, and has helped it to maintain its prestige among the faster growing cities of this section.

The growth of Augusta, following the Revolution, was practically unbroken in steadiness until the unsettling influences of the Civil War were felt. However, it rallied soon after the conflict was over, and in the sixties began the construction of a million-dollar power canal. At that time this was the greatest in the country. In the seventies it was increased in efficiency until approximately 14,000 horse-power was available for manufactories. Then a boom period started that soon made Augusta known as the "Lowell of the South." This activity in new enterprises lasted until the power, which was sold cheaply, was all leased. Then began a period of slow growth that is but just passing away, but is passing certainly and surely.

### **GREAT POWER AVAILABLE.**

Just as power gave the city its greatest growth in the past, so new power has come to its aid, and is making it again a potent factor in the progress of the South. About six months ago J. G. White & Co. of New York began constructing across the Savannah River, ten miles from the city's center, a \$3,000,000 dam, which when completed will place at the disposal of Augusta 31,000 horse-power, which will be conveyed by six tower lines.

The work was started only six months ago. In that time a modern village has been erected near the dam, with all the latest conveniences, including sewerage, electric lights, steam heating and a well-laid-off town, with ice plant, electric plant, and, in fact, virtually all the requisites that go to make up an ideal town. Over 500 people are at work on the project, and practically 1000 people constitute the present population. But this does not enumerate much of what has been done. Houses have been built and a hospital erected and equipped, and much of the work on the dam itself is under way.

The first sections of the upper and lower cofferdams have been completed, and the solid granite bed for the main concrete dam is being drilled out, while the site for the power-house itself is being prepared for the foundation work.

### **A GIGANTIC UNDERTAKING.**

The power-house will be built on the bed of the Savannah River, next to the Georgia side. It will be protected from above and below by gigantic dams, which will surround it. The power plant is designed for a one-story building, and will be 325 feet long and 60 feet wide, accommodating all the generating machinery needed to convert the present wasting water-power into electric current.

South Carolina has 151 cotton mills driven by electric power, and other manufacturing plants in the South are using it as rapidly as they can secure it. With the development of the enormous amount of power at Augusta many new industries may be expected to spring up. The advantages of Augusta as a manufacturing center are unsurpassed, and with the great territory around it as a distributing section the city will make wonderful progress within the next few years.

With the great amount of cotton received annually and the excellent demand for locally-manufactured goods, there is considerable likelihood of development further in this direction. However, the greatest progress will probably come from the introduction of other manufacturing plants of different nature, and when this is done more diversified prosperity will be noted on all sides.

### **WILL DEVELOP COUNTRY.**

The immense advantages to be derived from cheap electric power will benefit the entire country for many miles. Much of the surrounding country has been in need of railroad facilities. But the cost of grading for steam

railroads has made it prohibitive, and the running cost of electric railroads heretofore has been based on the cost of the current generated from steam by coal. However, this cheap electric power from water puts it where the running cost of electric railroads decreases, and then the much lower cost of construction of the electric lines and their ability to mount grades that the steam roads cannot puts it where it becomes an attractive railroad proposition.

With interurban electric lines throughout these different sections, the land values would increase many times; there would be easy and quick transportation for cotton, fertilizer, garden truck, butter, etc., and quick passenger service.

### **LOW FREIGHT RATES.**

The river has proved a valuable asset. It not only furnishes power, but makes Augusta attractive to manufacturers, and as a distributing point, by being the means of lowering freight rates to a point that almost gives the city port rates, though it is more than a hundred and thirty miles inland. For many years at least one line of steamers has been maintained on the river between Augusta and Savannah, affording shippers the advantage of an all-water route to the eastern ports, and affording means of shipping the output of the gigantic cotton mills, thirteen of which are either in the city or in the valley around it.

Plans are practically perfected whereby river traffic will be many times increased through an up-to-date barge line, and within a few months tugs, bearing their cargoes of costly freight, will be speeding to and from the sea. The river is open for navigation all the year around. The Government has deepened the channel to a point where even the greatest midsummer drought cannot prevent the boats from plying the river.

Along with the barge line municipally-owned terminals, ample to care for all business for years to come, will be provided. Plans for these are in preparation.

The advantage of this combination of cheap power, low freight rates and extremely cheap all-water haul to the Eastern markets, as well as connections at Savannah for South American ports through the Panama Canal, is patent to all manufacturers and those who desire a distributing point for their wares.

### **ANOTHER NATURAL ADVANTAGE.**

Climate has played no small part in the growth of the city. The average winter temperature, according to official figures, is 48 degrees, and for the summer 80 degrees. In the winter records below 20 are infrequent, and below 10 very seldom occur. Zero temperature has never been experienced, while in the summer there is no record of anyone dying from sunstroke or heat attacks in the thirty-odd years the Board of Health has been in existence.

It is not only to the tourist that these facts should most strongly appeal, but to the manufacturer and the farmer. The latter finds here ample opportunity to grow a great diversity of products, from the ordinary truck to melons, nuts, peaches and fruits of various kinds, as well as the standard farm crops. A well-distributed rainfall, averaging annually about 45 inches, prevents any of those droughts that affect some other agricultural sections.

The manufacturer has the assurance that weather will seldom or never interfere with the operation of his plant, while an abundance of vegetable foodstuffs helps to reduce the cost of living.

### **AN ENERGETIC PEOPLE HELP.**

The present activity and growth is not due alone to the natural advantages that surround Augusta. Its people have caught the spirit of the day, and are active in upbuilding work. The man who comes to Augusta is assured of a hearty welcome and co-operation.

Building permits in 1912 were more than double the year before, which in turn was largely ahead of 1910. During 1912 the cotton receipts passed the 500,000-bale mark. Civic and municipal improvements totaling nearly \$2,000,000 are going on within the city limits, while others are planned that will further enhance building activity.

The Empire Life Insurance Co. lately moved its headquarters from Atlanta to Augusta, and St. Joseph's Academy of Washington, a widely-known educational institution, has come to Augusta through the liberality of its people. Augusta is one of the designated winter aviation training schools for the United States Army.

Sustaining all these evidences of prosperity and progress, the general development of the city goes on steadily.

The city has a well organized and officered Chamber of Commerce, that is co-operating with those who desire to locate in Augusta, and to which all inquiries may be addressed.



VIEW OF COFFERDAM, SAVANNAH RIVER POWER DEVELOPMENT, BY J. G. WHITE & CO., AT STEVENS CREEK, AUGUSTA, GA.



# Waycross, Georgia { Busy and Progressive Metropolis of South Georgia



WAYCROSS, sometimes known as "The Queen City of South Georgia," and more fancifully still as "The Metropolis of the Wiregrass," is a busy, prospering municipality, the county-seat of Ware county, for which it is claimed that it has more available agricultural land than any other county in the State. The city is the meeting point of a number of railroads—the Atlantic Coast Line, with its branches to Savannah, Jacksonville, Brunswick, Albany and Montgomery; the Atlanta, Birmingham & Atlantic, running to Atlanta, Birmingham and Brunswick; the Waycross & Southern, running toward Jacksonville and destined to be extended still farther south; the Waycross & Western, making connection with the Southern and Seaboard Air Line system by way of the Georgia & Florida. Besides these the Illinois Central and the Louisville & Nashville run trains into the city by means of trackage arrangements with other roads. In this manner Waycross is made a railroad center of more than ordinary importance, and an average of fifty passenger trains a day are handled in and out of its stations. These lines of railroad help to make Waycross a most eligible location for manufacturing plants and commercial enterprises of many kinds.

There is a large forest area near Waycross, with yellow pine, cypress and some of the hardwoods standing by the millions of feet, waiting for the coming of the axeman and the mill to be worked into scores of articles of use in the economy of every-day life. This timber is so convenient to Waycross, and can be taken to its gates so cheaply, that it is one of the natural locations for a great sawmill and woodworking industry. Already there are located within the city two cypress mills, one of them the largest in the country, built of reinforced concrete, because its builders realized that the supply of timber would far outlast any structure of ordinarily perishable material.

In addition to these, there are shingle and lath mills, cabinet works and other plants engaged in various branches of the woodworking industry.

Other manufacturing plants in the city are those engaged in making brick and tile, foundry and machine shops, an ice plant and plants making turpentine. The Atlantic Coast Line Railway maintains in Waycross its repair shops, said to be the largest in the South, in which from 1800 to 2000 men are constantly employed. They pay out thousands of dollars in wages each month, helping to make up the city's \$250,000 monthly payroll.

There are good openings in Waycross for veneer mills, sash, door and blind factories, box, crate and basket mills, wood novelty works and plants making caskets, furniture, pulp and pine by-products. Such plants would have the advantage of securing their raw materials at low cost, and of unsurpassed facilities for reaching excellent markets with their products. The opportunities are promising also for canning factories and factories making overalls, cheap shirts, shoes, automobiles and various other articles. There is plenty of good factory labor, living conditions are good, and plants of the kinds enumerated can be conducted in Waycross in a most economical and satisfactory way.

There are a number of wholesale houses in the city handling groceries, hardware and drugs, and good openings for those engaged in dry goods, shoes, notions and other lines. The facilities for transportation and the rapidly-growing country in which Waycross is located peculiarly adapt it to the jobbing business.

With two banks and two trust companies, Waycross offers excellent banking facilities. The deposits have increased over 400 per cent. in ten years. The postoffice facilities have been improved recently by the erection of a \$100,000 Federal building. The postoffice receipts have gained over 100 per cent. in ten years.

The manufacturing plants, railway shops and general railway business, combined with good patronage from the surrounding country, keep a great deal of money in circulation in Waycross, and the consequence is that the local business houses enjoy a high degree of prosperity. The growth of the city has been rapid during the past two decades. In 1890 the population was 3364, in 1900 it was 5919, in 1910 it was 14,484. These are the census figures, and embrace none but the population inside the narrow limits of the municipal boundaries. With the great growth that has come in the past ten years there has been a rapid peopling of the immediate suburbs, and this population is as much a part of Waycross as that actually inside the corporate limits. Counting this, and with the growth made since the taking of the census, it is estimated that the population of Waycross now approximates 20,000.

As a municipality Waycross is distinctly progressive. It has more than twelve miles of paved street, those in the business sections being laid with vitrified brick, and thirty-five miles of cement sidewalks, of which latter 75,000 square yards have recently been laid. A bond issue of \$100,000 was authorized by an election held a short time ago, of which \$30,000 is to be used for street paving. As the law provides that two-thirds of the expense of street paving shall be borne by the abutting property-owners, this will mean the expenditure of \$90,000 more in that work in the immediate future. Of the remainder of the money received from the sale of the bonds, \$30,000 is to be used in the betterment of the water-works system. This system is owned by the city, and the water supply is obtained from deep wells, which yield a large amount of pure and delightful water. This water is never muddy, needs no filtration, and is absolutely free from contamination of every kind.

The public school system is to receive \$25,000 of the money from the bonds, to be used in putting up additional buildings.

As an evidence of the progressiveness of the people of Waycross, it is pointed out that they keep their bonded indebtedness up to the limit allowed by law. As soon as a reassessment of property shows an increase in taxable values, a new election is provided for and a bond issue is authorized for as much as the increase will allow. In this way public improvements are kept always as far advanced as possible.

Local capital is now engaged in building a street and suburban railway line and in putting in a gas plant. The city is already well lighted by electricity.

Waycross is located in the midst of the famous truck-growing and staple crop-raising section of Southern Georgia. It is about sixty miles from the Atlantic Ocean, about one hundred miles from the Gulf of Mexico, and lies on the watershed dividing the waters that flow into the Gulf from those that seek the Atlantic. The soils of the surrounding country embrace those best adapted to trucking, as well as those that produce well of the staple crops. For trucking the soils are said to equal in every way, and to be practically identical with, those that have made the truck-growers of the Norfolk-Portsmouth section rich, and, being farther South, have the advantage of getting their products on the market considerably earlier than those of that famous trucking section. The list of crops these lands will profitably produce includes practically everything grown in the temperate zone—cucumbers, cabbage, Irish potatoes, sweet potatoes, cauliflower, lettuce, radishes, beets, peppers, eggplant, okra, asparagus, spinach, carrots, tomatoes, celery, peas, beans, watermelons, canteloupes, strawberries, peaches, grapes, pomegranates, Japanese persimmons, Japan plums, pears, figs, plums, cotton, corn, oats, sugar-cane, and numerous hay and grazing grasses and legumes.

In cotton, both the high-priced Sea Island and the upland varieties produce well; and in corn, while the average production is about forty bushels to the acre, a record of 139¾ bushels has been made. Oats yield well, and a number of the best farmers have recently been making them their leading money crop. The growing of sugar-cane for the manufacture of syrup is an industry of considerable importance, and one that pays well. Cane yields a large crop per acre, and it is of the very highest quality in the making of syrup. It matures earlier than that raised in Louisiana, and for that reason possesses some advantages. The analysis of the South Georgia cane shows 13.42 per cent. sucrose, 1.12 per cent. reducing sugar and 81.10 per cent. purity. The relatively high percentage of reducing sugar is of great advantage in making syrup, because it has a tendency to prevent crystallization. Dr. H. W. Wiley, former chief of the Bureau of Chemistry of the United States Department of Agriculture, is quoted as saying:

"In one particular the southern part of Georgia stands pre-eminent, and that is in the manufacture of table syrup from sugar-cane."

Georgia has long held a foremost place in the production of watermelons and canteloupes, and nowhere in the State do they grow to better perfection than in the country about Waycross. Trainloads of melons are shipped from South Georgia to Northern markets every season.

Peaches have always been found to produce well about Waycross, and within the last few years large orchards have been set in that fruit. The production of peaches promises to become almost as extensive in the Waycross country as in the great peach districts of Georgia a little farther north. Many pears were grown about Waycross a number of years ago, but the industry was practically abandoned because of blight. Now that science has provided a remedy for that ill, it has been taken up again, and promises to regain its former importance. Many figs are being planted also, and the yield is found satisfactory.

The growing of pecans in commercial quantities is being undertaken by a number of people, some of whom are going into the business on a very large scale. This has been brought about by the great success enjoyed by a few people who years ago planted orchards of paper-shell pecans, from which they are now reaping wonderful profits. The soil and climate of the Waycross section seem to be specially adapted to the growing of that popular nut, and there is no other permanent product calculated to yield so large a money crop per acre.

Cattle, sheep, goats, horses, mules and hogs thrive wonderfully in the Waycross country. They can graze in the open during the entire year, and need no shelter to protect them from such wintry blasts as prevail in northern stock-growing States. Green forage exists during all the months of the year, and where the natural growth is insufficient to meet the demands made upon it, forage crops are easily grown to supplement it. These forage crops are usually planted in soil that has already produced a crop of some other kind during the same season. The mild climate, the abundance of pure water and the rich and nutritious grasses that grow lush and sweet during every month in the year make conditions ideal for dairying, and there is no section of the country in which this branch of the farming business can be carried on with more profit. Poultry-raising is also profitable when engaged in with intelligence and industry. Chickens thrive well, hens lay during all the months, and the market is ready for many more of both chickens and eggs than are being supplied.

In short, there is no section of the entire country which offers better opportunities for making money in agriculture than that portion of South Georgia of which Waycross is the commercial and transportation center.

As a place of residence Waycross presents numerous attractions. It has excellent schools, with courses of instruction that run from the primary schools through a high school that prepares its graduates for college matriculation. The Burin-Bell Institute, a Baptist school of collegiate character, is located there, and there is also an excellent commercial school that prepares its pupils for business careers. Waycross has two splendid Y. M. C. A. homes—one city and one railroad.

There are numerous handsome churches, representing most of the leading denominations, and the length of their membership rolls and the attendance upon their services speak for the moral and religious tone of the community.

Many handsome homes abound, and the generous hospitality that has made the South famous is there dispensed, heightened in effect by the culture and grace of its dispensers.

The climate is delightful, the average temperature throughout the year being 66.7; that of January, the coldest month, 50 degrees.

For business, for health, for education, for social enjoyment, Waycross offers inducements unsurpassed by those of any other city in the country.

# Georgia Farm, Fruit and Pecan Company, of Waycross, Georgia, and its Unique Plan for Co-operative Farming

**T**HE HON. GEORGE W. DEEN of Waycross, former Senator in the Georgia Legislature, has worked out a plan for co-operative land development and cultivation that promises a great deal, not only for those who personally become interested in the enterprise, but for the entire Wire Grass section of Georgia as well.

Because of his faith in the soils, climatic and health conditions of South Georgia, Senator Deen has extended his land holdings until he controls more than 100,000 acres, practically all in one body, near Waycross, in Ware county, Georgia. His present enterprise, the Georgia Farm, Fruit & Pecan Co., is using 50,000 acres of these lands as a basis of operations with the object of improving and cultivating a large area. The company will cultivate the crops suited to this soil and section, and will specialize in the planting of fruit and pecan trees, which will tend to make permanent profit for those owning an interest in the enterprise.

The plan of organization of this company is unique and interesting, and of indubitable feasibility.

In organizing the company Senator Deen first made a careful estimate of the money it would be necessary to spend in development work and the amount of property to be turned over to the company. The result was the company was incorporated for \$1,000,000, which is on the basis of \$20 for each acre. Then Senator Deen deeded his equity in the 50,000 acres to the company in such manner that he will get no returns until the preferred stockholders have been paid a cumulative dividend of 7 per cent. Preferred stockholders will also participate in the earnings of the company in addition to this 7 per cent., the dividend being merely the assurance of a definite income on every investment. In organizing the company Senator Deen provided for the security of each investment by issuing preferred stock with a par value of \$25 secured by one acre of land. Lands serving as security for stockholders are deeded to the Waycross Savings & Trust Co., free of incumbrance, and are held in such a way that no matter what happens each investor is protected. Furthermore, every investor can try out the company until January 1, 1917, and then, if he desires to exchange his stock for land, he has the privilege of taking his certificate to the trust company and exchanging it for a warranty deed for as many acres as he holds shares.

The annual rainfall in the Waycross section is 46 inches, and is so well distributed throughout the year that three crops may be matured on the same land within one year. Such conditions minimize the risk in farming and the profit is absolutely certain, provided the work is prosecuted with industry and intelligence. The company employs experienced men to superintend the various branches of its operations, and its ability to secure the most modern machinery insures large profits from every branch of farming.

The man with small acreage has not time or opportunity to watch the markets, nor can he ship in such quantities as to get the benefits of the lowest freight rates. The concern whose production is so large as to justify an expert to do the selling, and which can ship in car loads and train loads, has advantages that frequently enable it to turn a losing proposition into a money-maker, or to increase the net earnings of an enterprise already profitable.

This is the theory upon which the Georgia Farm, Fruit & Pecan Co. was formed, and its success is as certain as that of any other well-organized and intelligently-conducted business. Profit to the stockholders is assured. The man with a 40-acre farm who works all the year and finds after allowing him-

self the wages of a farm hand that he has cleared \$10 an acre is not much ahead, but the man who buys 40 shares of this stock and finds it paying him \$10 per share annually, while he employs his time at something else, has made a most fortunate investment.

To pay this preferred dividend of 7 per cent. the company only needs to make an average profit of \$1.75 per acre. In the Waycross section three crops can be matured in a single year on the same land; therefore to pay this dividend it is only necessary to make a profit of 60 cents an acre from each crop. A profit of \$10 an acre annually would provide 40 per cent. dividends.

The investor who holds the preferred stock has the opportunity for very large returns, while the man who invests for present profits and a future home, who later surrenders his paid-up stock and takes land in exchange, will receive more than the value of his original investment. The land to be secured this way is of the most productive kind. It is sandy loam for the most part, and is particularly adapted to the production of corn, oats and sugar-cane as field crops—the former two to be followed by crops planted for hay, such as cow peas, soy beans and other legumes—and to Irish and sweet potatoes, cabbage, turnips, and practically all other kinds of truck. Peaches, plums and figs yield abundantly, and in nuts the pecan is the best producer. Some of the best pecan groves in the State are in Waycross and its vicinity, and in no case is a well-cared for grove of 15 years of age valued at less than \$1000 an acre.

Here, then, is the opportunity for the large investor who wishes more than the ordinary returns, and at the same time demands a high degree of security. It is also the opportunity for the man who wants to move on a Southern farm in an ideal climate some time in the future, for it enables him to get better interest on his money than any savings bank will pay, and with none of the expense of property ownership until he moves on the land. In addition, he will get the land at its present low price, and the value will be much greater by the time he is ready to take possession. The company intends to spend upwards of \$500,000 in development

work on part of this land, and its improvements are certain to increase the value of surrounding lands.

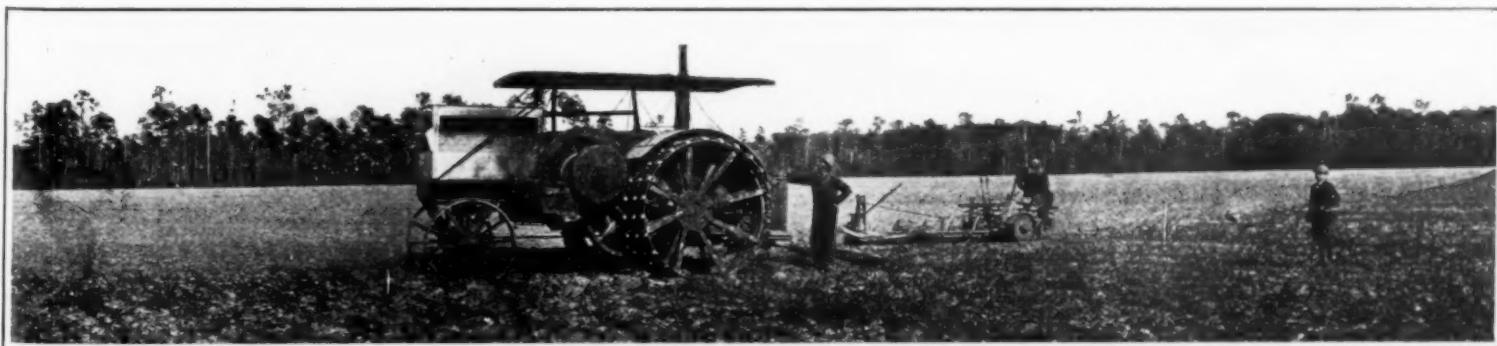
After four years, when the right to exchange stock for land has been cancelled, those who keep their stock have the prospect for much larger profits, for when the pecan and other trees now being set begin to bear the profits should amount to many times the return from ordinary farming. Every investor who exchanges his certificate for land decreases the dividend-sharing capital stock, and in a few years those who hold stock should be receiving profits from a large acreage represented by a small capitalization. On the other hand, land set aside to be exchanged for stock, and not so exchanged, will revert to the company, and should then have a market value far in excess of the present price of the stock. The work of development was started about April 1, 1912, and soon so much land was prepared for the plow that it became necessary to purchase a traction engine to place it under cultivation. The cleared area has constantly grown larger, and the stump pullers are now at work a mile and a half from the town of Astoria, the center of operations.

Senator Deen is giving personal attention to clearing and cultivating the land, bringing to the task broad experience. His confidence is founded on knowledge, and his enthusiasm inspires all with whom he comes in contact.

In all the South there is not a sounder proposition, nor one more firmly founded, or more safely buttressed against the possibility of failure, than the Georgia Farm, Fruit & Pecan Co. Any information desired can be had from the company.



CORN GROWN BY THE COMPANY, 1912.  
Crops like this mean 100% dividends.



GASOLINE TRACTOR USED FOR PLOWING.  
Nearly 700 acres have been cleared during first ten months.





PACK SQUARE, EAST, ASHEVILLE, N. C.

## Asheville, the Business and Tourist Center of the "Land of the Sky"

Standing upon some eminence in the vast hill-girt amphitheater in the center of which sits Asheville, looking westward across the beautiful valley of the French Broad and the rolling plateau beyond, as it merges into the mountains that rise height upon height to the majesty of Pisgah's six thousand feet, and watching the setting sun as it bathes the highest peak-tops in its flood of molten golden glory, the beholder is led to wonder whether upon all this stage of human action which men call the world the Almighty hand has set a scene more grandly fair.—Geo. Byrne.



ASHEVILLE, gem of the Appalachians, is the capital of Buncombe County, North Carolina, far-famed as America's Beauty Spot, heart of the unmatched area of scenic splendor poetically known as "The Land of the Sky." Buncombe county lies on the Blue Ridge plateau at an average elevation of 2250 feet above sea

level, overlooked on south and east by the rising heights of the Blue Ridge, and reaching north and west to the foot-hills of the Unakas and the Great Smoky Mountains. This great Western North Carolina plateau, of which Asheville is the social and commercial center, embraces an area of approximately 2,000,000 acres, of which some 60 per cent. is still forest-covered. The city lies midway of a circle whose circumference takes in the territory bounded by the Mississippi River, the Gulf of Mexico, the Atlantic Ocean and the Great Lakes, and is within the radius of the country's densest population and greatest purchasing and consuming power. It is also well within the limits of the country's richest resources of raw materials for manufacturing purposes, its fuel and its hydro-electric potentialities. Likewise, it is within the circle of the country's most prolific area of production in the various food crops that furnish sustenance for man, as well as within that very inner circle that embraces the most invigorating atmosphere, the most wholesome water and all those other natural conditions that make for human health, happiness and length of days. The annual mean temperature of this favored region is 55 degrees.

For many years Asheville has been noted as a tourist and health resort, its location being such that those weakened and enervated by the overpowering heat, or with vitality lowered by the too rigorous cold of other sections, find immediate relief in its invigorating ozone, and many an invalid has been won back to health and strength by a season spent amid its life-giving surroundings. So well known is it as a health and tourist resort that most visitors express surprise when first made aware of the industrial and commercial advantages abounding there. That these advantages are real and not imaginary is proven by the careers of a number of manufacturing concerns that have successfully put them to practical test.

Among the oldest of these are the Asheville Cotton Mills, established in

the early eighties, and so successful that it is but recently they have put in a great deal of new machinery, installed new departments, added new buildings and made preparations of numerous kinds for increasing their output. These mills manufacture chambrays chiefly.

The big tannery of Hans Rees' Sons is one of the older plants that have been successfully operated here. This plant turns out a high grade of belting leather that is shipped throughout the civilized world.

The American Furniture Manufacturing Co. is a newer concern, but none the less important. It manufactures furniture of high class, not only making use of the fine grade of oak and other hardwoods to be secured from nearby forests, but also using mahogany imported from the tropics to be turned into articles as handsomely finished as can be found anywhere.

The United States Furniture Manufacturing Co. also has a plant here in which furniture bought "in the white" from other plants is given the finishing touches.

The National Casket Co. maintains here a plant that cuts dimension stuff, and sends it to other places to be put together and finished. This is a very large plant and carries on its yards in stock many thousands of dollars' worth of lumber.

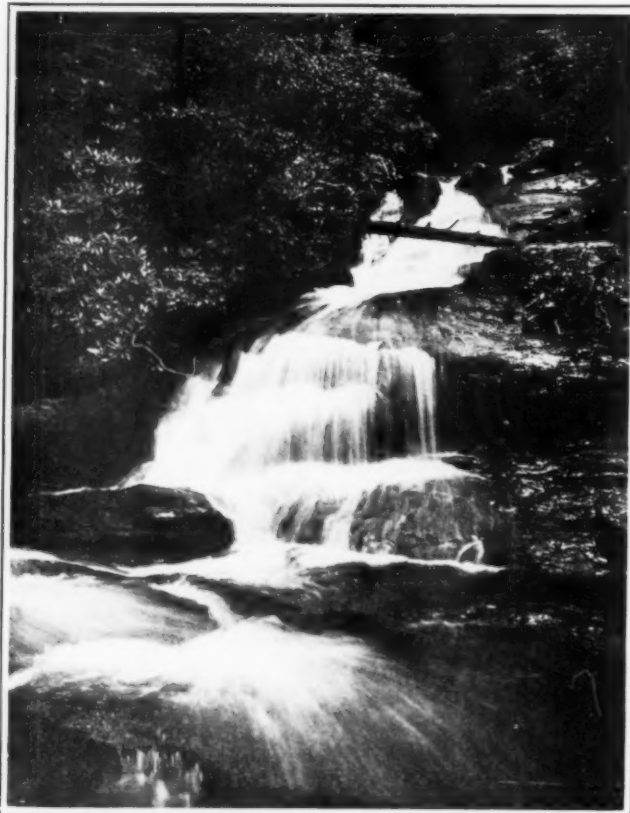
The Azalea Woodworking Co. has an important mill here, in which it makes interior trim of the highest class, a fine line of hardwood flooring and wainscoting, and also sash and doors.

Other woodworking plants are the planing-mills of the Williams-Brownell Planing Mill Co., J. M. English & Co. and J. L. English; the box, table and table top factory of R. P. Foster; a mill that cuts shuttle blocks, a veneer mill and a wagon factory.

Other manufacturing plants are a quilt mill, a mattress factory, metal shingle factory, harness and saddle shop, three foundries and machine shops, flouring mills, with a department devoted to making

a breakfast food from wheat hearts; a mica factory turning out mica in its various forms—sheet mica, punch mica and ground mica. There are a number of dairies that make butter of high grade.

Asheville lies within the chief hardwood zone of the South Appalachians, and the products of its forests are brought handily to its mills. The mountain section of North Carolina, rich in minerals and ores, is all readily ac-



CRYSTAL FALLS, SOURCE OF ASHEVILLE'S WATER SUPPLY.

cessible from Asheville, and lies ready to pour its wealth of mine and ore bed into her furnace yards when they shall make the demand.

Asheville is the center of potentialities for hydro-electric developments running to many thousands of horse-power. The coal regions of Tennessee are brought close to the city by easy railroad communication, and those desiring to generate their own power can procure fuel at low cost.

One of the greatest assets Asheville possesses as a manufacturing town is a climate free from extremes of heat and cold, an atmosphere that carries a minimum of humidity—inspiring, invigorating, tonic to a high degree—a climate that keeps the man who labors with hand or brain, or both, at the highest point of efficiency, enabling him to give the maximum amount of service throughout all the months of the year.

The labor is, for the most part, white, native born, intelligent, ambitious, loyal, free from strikes and other costly and annoying features frequently encountered in other localities. An expert of the highest standing, a large employer of labor, has often said that nowhere else in America can be found conditions equaling those in this section for the development of great working plants requiring the highest class of skilled labor. This labor can be employed at Asheville at the same wages or less than must be paid elsewhere for labor much less efficient, because living conditions are such that the same money represents more in the way of the necessities, comforts and conveniences of life. The mild climate calls for much smaller expenditures for housing, clothing and fuel, while the long growing season makes food products cheaper than in the majority of manufacturing localities.

There are many articles of manufacture that could be made in Asheville with profit to the manufacturer in addition to those now being produced there. A partial list of these includes mills for making cotton fabrics of various kinds, woolen mills, knitting mills, silk mills, factories for making shirtwaists, overalls, working shirts, wood novelties, shoes, tables and table tops, furniture of all grades, especially chairs; also factories for canning vegetables and fruits and fruit by-products.

Asheville has a number of wholesale houses engaged in selling dry goods, notions, groceries, hardware, saddles and harness, furniture and meats, and they do a large business over a wide expanse of territory. There are good openings for several more wholesale houses, notably those handling shoes and hats.

In banking facilities Asheville measures up to all requirements. It now has five banks with capital, surplus and deposits of more than six million dollars.

A good index of the city's growth in business during the same time is furnished by the postoffice receipts, which were \$36,515.04 in 1900, \$50,192.23 in 1905, \$74,877.89 in 1910, \$77,765.39 in 1911, \$82,336.73 in 1912. The population of Asheville, including suburbs, is 32,000.

As a place of residence Asheville presents attractions almost innumerable. Among these is an adequate and unfailing supply of pure water. The water is taken from mountain streams, the entire area feeding which—some 10,000 acres—is owned and controlled by the city. This watershed is covered with virgin forest, and wardens constantly protect it from such intrusion as might cause contamination deleterious to health. There is no cultivated land in the boundary, and the water is, therefore, always pure. It is caught in the intake located nearly five hundred feet higher than the city's business center, whence it is sent through the mains by gravity, meeting every requisite for a perfect water supply—purity, quantity and pressure.

In connection with the water system, there is a modern fire department with 21 Gamewell fire-alarm stations, 250 fire-hydrants, two fire companies and two 80-horse-power Seagrave motor trucks equipped with 2000 feet of hose, extension and other ladders. Fire losses extremely low.

Supplementing the water system is a sewer system of more than 50 miles that has been pronounced perfect. The great abundance of water makes it possible also to keep the streets clean, which is done by frequent washing.

Asheville has compulsory vaccination for school children, thorough milk inspection, a modern abattoir with inspection of all meats not inspected by the Government. Being high, 2250 feet above sea level and free from standing water, Asheville has no mosquitoes, and therefore no malaria.

These rigid rules for the preservation of health are due to the efforts of a very active board of health, backed by a city government that is liberal in furnishing it with money and enforcing its rules. Asheville enacted the first ordinance ever adopted in this country forbidding expectation upon the sidewalks, and was the first to inaugurate an anti-fly crusade, and is said to be doing more than possibly any other city in the country in the way of adopting and enforcing protective measures for the health of its people.

Other features of Asheville are its beautiful homes, in which culture and refinement are joined with the most generous hospitality; its public schools, thoroughly modern and with courses of study running from primary grades through the grammar schools and topped off by a high school course of ap-

proved efficiency; a large number of private schools of high standing; churches in which all the leading denominations find representation.

Asheville has almost forty miles of paved streets, laid chiefly with brick and bitulithic, and these join on to improved roadways that carry many miles into the country on every side. A 45-foot boulevard is being constructed to the top of Sunset Mountain by Dr. E. W. Grove, the owner, and will be open to the use of the automobile driving public. The city also has an excellent electric railway system, 17 miles, furnishing quick access to all its parts, and reaching into several of its suburbs. Also an interurban line to Weaverville, an enterprising village nine miles away. There were 1932 'phone subscribers January 1, 1910, and 2782 on January 1, 1913.

Mr. George W. Vanderbilt, custodian of one of the country's great fortunes, with unlimited means at his command, and with all the world to choose from, selected the "Land of the Sky" as the most desirable spot in which to found a great estate. On a 12,000-acre tract adjoining Asheville he founded a model town which he calls Biltmore, laid off a great park known by the same name, and built a spacious chateau, where he makes his home during a part of each year. He has established breeding farms, dairies, poultry-yards and numerous other adjuncts to modern high-grade agriculture, introducing many new breeds of stock that have been of great benefit to the section, both in raising the grade of the stock bred and in showing what intelligently-directed effort will accomplish. He also maintains a hunting preserve containing 120,000 acres, and known as Pisgah Forest.

The country about Asheville presents excellent opportunities for general farming, trucking, stock-raising and fruit-growing. The lands produce abundantly of the grains and grasses, and by the application of scientific methods some high records in corn production have been achieved in Buncombe county—158 bushels and 54 pounds on one acre during 1912 being the high record. Cattle thrive throughout the year with a minimum of feeding. Dairying is a branch of the agricultural business that presents inviting features in this section, because of the rich, milk-making food. Poultrying is rendered profitable by practically the same causes. Sheep, hogs and horses also thrive upon the nutritious grasses that grow throughout the greater part of the year. All kinds of truck crops yield abundantly, and the market is good for all that can be produced. In apples Western North Carolina has a record unsurpassed, having taken the sweepstakes premium at the last three National Apple Shows. Grapes produce prolifically, and many vineyards in the country about Asheville yield profitable annual crops to their owners.

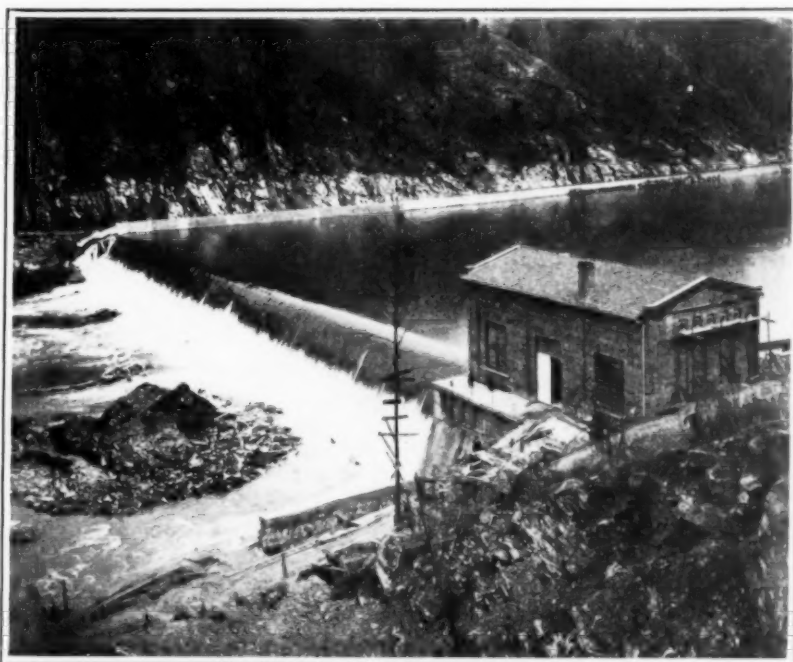
The hotels of Asheville are noted the country over and have added greatly to the popularity of the city among tourists and those who travel on business. The possession of these hotels and an auditorium of large seating capacity has made the city one of the

most popular points in the South for holding conventions and other gatherings, of which it entertains many each year.

Asheville is just now in the enjoyment of an impulse in building that extends to both residence and business structures. Many of these are imposing in size and modern and up-to-the-minute in design and finish. Chief among the buildings now in course of construction is Grove Park Inn, a hotel being erected by Dr. E. W. Grove of St. Louis on the western slope of Sunset Mountain in the immense park that bears his name. The building is 376x89 feet, built of stone quarried within a few hundred yards of its location, the outer face of the walls being covered with the loose stone from the mountain sides, tied into the walls and set in cement that is concealed from view. Inside everything will be as rich and elegant as the outside is rugged and picturesque, the intention of the owner being to have "not the largest, but the finest tourist hotel in America." It will cost approximately \$750,000. It will be open about July 1 of the present year, and practically every one of its 220 rooms has been engaged for the summer. The Langren, an eight-story fire-proof hotel, was completed at a cost of \$325,000, and formally opened July 4, 1912, while the Battery Park, famous everywhere, has just completed improvements aggregating \$75,000.

Asheville has an active Board of Trade with a large membership among its enterprising business and professional men, which is doing excellent work in bringing to the notice of the world the advantages of the city and section. Much of the growth and progress of the past few years has been due to the efforts of that very progressive organization, which gives promptly information desired by inquiring investors and visitors.

This, in brief, is the story of Asheville's material attractions, without attempt to describe those ravishing allurements, of scenic splendor which have made the city and its section famous, and which none but a poet's pen can adequately portray. But he must be dead indeed to all sense of beauty who can remain unmoved of appreciative interest amid such scenes of loveliness, wrought by nature in her most lavish mood.



NORTH CAROLINA ELECTRICAL POWER CO.  
Source of Asheville's Light and Power.



# Kenova, West Virginia, and the Wonderful Opportunities It Offers

## Meeting Place of Raw Materials, High Grade Fuel and Unusual Transportation Facilities



LYING in the angle caused by the junction of the waters of the Big Sandy with those of the Ohio River, with Kentucky removed only by the width of the former stream and Ohio by that of the latter, Kenova, W. Va., possesses advantages of physical position and natural and artificial environment that are hard of duplication.

In these days of conservation of resources of every kind, when a few cents per unit loom large in the aggregate cost of production, and every economy possible must be exercised in the manufacture and distribution of the output of mill and factory, the measure of a town's attractions for industrial plants is written in figures of facilities for assembling raw materials and distributing finished products, in terms of heat-cost and power-production, in facts concerning labor supply and living conditions. By all these standards Kenova measures up to the best requirements.

In the matter of transportation facilities Kenova is peculiarly blessed. The mighty Ohio, already navigable for boats of large size throughout most of the months of most years, is being so improved by the Government that it will have at all times, from Pittsburgh to Cairo, a nine-foot stage, so that boats freighted with coal or manufactures can pass up and down at will. The Big Sandy has already been locked and dammed from its mouth for many miles towards its mountain source, and is ready to pour into Kenova factories the wealth of forest and mine from its upper waters. These two streams form facilities that make for the greatest economy in assembly and distribution of materials and products. But they are by no means all the lines of transportation that wait upon Kenova.

The Norfolk & Western Railway, with its trunk line running direct from Hampton Roads, on the Atlantic seaboard, crosses the Ohio River at Kenova and plunges into the heart of the highly productive Middle West. Eastward it traverses the great Pocahontas coal region and the thickly timbered hardwood section of the western slope of the Appalachians. For a good many miles on this eastward course from Kenova it runs in two branches, and both are valuable feeders for the plants now located in that town and to be located there.

The Chesapeake & Ohio Railway, also having its tidewater terminals on Hampton Roads, passes through Kenova and into Kentucky on its Cincinnati way. Just over the border the Chesapeake & Ohio sends out two branches from its main line—one up the Big Sandy into the coal fields of Eastern Kentucky, the other into the famous Blue Grass region, past Mount Sterling, Frankfort and Lexington and on to Louisville. A few miles east it cuts through the New River and Kanawha coal fields, and throws out branches into the big timber districts that border the waters of the Guyan and Coal rivers.

The Baltimore & Ohio has at Kenova the terminus of its Ohio River division the line that carries to Wheeling, Parkersburg and all the rich and populous West Virginia towns lying on the Upper Ohio. It connects with the main line at Parkersburg and Benwood, thus giving unexcelled connections to points east and west.

A first-class electric interurban line runs through Kenova, joining it with Huntington, W. Va.; Catlettsburg and Ashland, Ky.; Ironton, Ohio, and intermediate points. This road gives quick service, furnishing Kenova citizens all the conveniences, with none of the disadvantages, of residence in larger towns.

In addition to being thus fortified in the matter of transportation, Kenova presents other telling points as a manufacturing center. First of these is its cheap fuel of inexhaustible supply. The greatest bituminous coal fields of the world are directly joined to Kenova by the Norfolk & Western and Chesapeake & Ohio railroads, and the mileage to them is short. The amount of coal in these fields is reckoned in billions of tons, equal to the demands of hundreds of years, and they clinch the claim of Kenova to being a fuel center of inexhaustible supply. In coking qualities, in output of gas, or in power-generating potentialities, the coals centering at Kenova are not surpassed by those elsewhere—possibly not equaled.

East, northeast and southeast of Kenova lie some of the richest gas-producing fields now known, and through a great pipe line that penetrates Kenova's borders these fields are pouring their fluid fuel into its Cincinnati market. The company owning this pipe line makes an attractive price to those using gas for manufacturing purposes at Kenova, thus giving that place the advantage of the most convenient fuel known for general manufacturing purposes.

Raw materials of many kinds are found within easy reach of Kenova—the timbers of the valleys of the Big Sandy, the Twelve-Pole, the Guyan and other streams—poplar, the oaks, chestnut, ash, hickory, lin, hemlock, maple—all these and many more woods abound in immeasurable quantities within the zone of Kenova's transportation reach. Already there are some important plants at Kenova engaged in manufacturing the products of these forests. Among them are a bending plant, a box factory, a company that makes auto spokes and oak-veneers, a concern that makes crossties in large quantities, one that manufactures high-grade poplar lumber, and one or two sawmills. The quality of the timber tributary, the facilities of transportation, and the high class of labor procurable, make Kenova a most inviting site for furniture factories making furniture of the better qualities. Handles, spokes,

boxes, crates and wood novelties of many kinds could be profitably manufactured in Kenova.

The quality of the limestone lying close about Kenova makes it an excellent site for lime-burning plants, and the other ingredients necessary to the making of Portland cement render it an almost ideal point for a plant of that kind. Glass sands of the best quality are easily brought there to meet the cheap fuel, and clays for making brick, sewer pipe, building and drainage tile and other things of a kindred nature are to be found on all sides.

The living conditions in Kenova are most favorable. Lying in the great Ohio Valley which stretches up and down the river for many fertile miles, the town has the advantages that accrue from a highly productive agricultural region, enabling its residents to live well at much less cost than in communities less favored. The bottom lands that lie along both sides of the Ohio are famous for their productions of the trucking crops—potatoes, tomatoes, beans, cabbage, onions, lettuce, carrots, turnips, in fact, all the vegetables known to the table—for melons, and the best of the standard fruits, as well as for the grains and grasses, and these enable the residents of Kenova and the other towns located in that section to live well at much smaller cost than is possible to residents of less favored communities. Not only that, but the same agricultural strength of the valley causes it to be filled with a farming class that is highly prosperous and helps to create a general prosperity in which every individual community shares.

The climate of the Kenova section is equable, free from extremes of heat and cold, and the nights are cool, even in midsummer, so that the artisan who puts in the day at work readily recuperates his strength from the sleep he enjoys at night. There is an abundance of pure, wholesome water, and conditions combine generally to make the location an extremely healthful one.

These things operate to attract a high class of laboring people, and the consequence is that manufacturing plants established in Kenova have little trouble to secure plenty of the best workmen. The labor now employed there is intelligent, ambitious and easily controlled.

The manufacturer will look long before he finds another location offering advantages equal to those enumerated above—transportation facilities, easily assembled raw materials, cheap fuel of the very highest grade, unsurpassed living conditions, and plenty of high-class labor. But these are not all that Kenova has to offer.

The Kenova-Huntington Land Co., which owns a large acreage in and about the town, has set aside a very considerable boundary for factory sites. Sites can be found there lying on one or other of the two rivers, where plants can have their own wharves, if desirable, giving them every advantage of river transportation. To any of these sidings may be easily thrown from the belt line that runs around the town and connects with all the railroads having trackage there. This gives the combination of convenience to both rail and water, a combination that cannot be excelled so far as shipping facilities are concerned.

These sites will be furnished free of cost to such manufacturing concerns as wish to locate in Kenova and can show their worth and their responsibility.

Eight factories of various kinds are now pursuing profitable careers in Kenova, showing that the manufacturing business there is beyond the experimental stage.

Nor is the manufacturing business the only one offering good opportunities for profit. The excellent transportation facilities enjoyed by Kenova make it a good distributing point for general merchandise, and a number of jobbing houses would find it a most eligible location. One wholesale grocery is already established there and is selling its goods over a wide expanse of country.

Kenova has one bank, the First National, which pursues a most liberal policy in dealing with approved business institutions, and which is proving distinctly helpful in building up the commerce of the town.

Kenova offers numerous attractions as a place of residence, in addition to those it possesses as a place for manufacturing and general business. It has an excellent system of public schools, the term running nine months each year. It has a number of church edifices, representing leading denominations, and the community tone is distinctly moral and religious. The fifteen-minute interurban car service between Huntington, W. Va., and Ashland, Ky., a half-hour's run on either side of Kenova, brings the people of the town in close touch with cities of considerable size for shopping, for attending the theater, or for any other purpose for which they might wish to visit towns of larger growth.

The location of Kenova is such that there are many beautiful residence sites, and the home-builder has choice of living on the high bank overlooking the Ohio River, or back farther on the level land of the broad bottom, or upon the picturesque foothills that furnish a sweeping view of bottom, bank and river.

Those desiring more detailed information concerning the extraordinary opportunities offered by Kenova for the successful establishment and operation of manufacturing or commercial enterprises can secure it by communicating with the Kenova-Huntington Land Co., Huntington, W. Va. The gentlemen composing this company are for the most part citizens of Huntington and of high standing in the business affairs of that city. Their names are the guarantee of any of the company's undertakings.



VIEW OF NORFOLK FROM THE INNER HARBOR.

## Norfolk, Virginia, Natural Center of Great Industrial and Commercial Developments



**N**ORFOLK, VIRGINIA, while claiming distinction as the second city on the Atlantic seaboard in importance in respect of transportation facilities, yields primacy to none in the matter of location and of harbor accommodations, health conditions, opportunities for the profitable carrying on of manufacturing, commercial or agricultural enterprises, or advantages and attractions as a place of residence.

In the way of transportation facilities—for the assembling of raw materials and the distribution of finished products—it has eight trunk lines of railway which, with their connections, have 42,000 miles of trackage, carrying into every section of the country, and broadly supplementing those natural lines of transportation, the Chesapeake Bay, numerous navigable rivers, and the boundless waters of the Atlantic Ocean. The eight railways representing this 42,000 miles of trackage have their deep water terminals at Norfolk, seven ocean-going steamship lines regularly fly their flags in Norfolk harbor, smaller lines carry the city's commerce up and down Chesapeake Bay, and those still smaller carry traffic to and from the interior by way of the many navigable streams that find their outlets there, while scores of tramp ships visit the Norfolk docks in the course of the year, carrying cargoes to and from every seaport. It has been said, and truly, that at the Norfolk terminals freight from any point in the United States reached by rail may be unloaded from cars on one side of a pier, and on the other be loaded into a vessel bound to any port in the world.

The railway lines centering in Norfolk are the Chesapeake & Ohio, the Norfolk & Western, the Seaboard Air Line, the Atlantic Coast Line, the Southern, the Norfolk Southern, the Virginian and the New York, Philadelphia & Norfolk. The steamship lines regularly visiting the harbor are the Clyde, the Old Dominion, the Chesapeake, the Merchants and Miners, the Baltimore Steam Packet and the Norfolk and Washington, and a long list of smaller ones too numerous to name, but each having its influence in building up the commerce of the city.

There is a channel from Norfolk harbor through the world-famous Hampton Roads to the Atlantic Ocean, 35 feet in depth and varying from 300 to 450 feet in width, through which the largest ship afloat may pass in safety. The value of the commerce annually carried through this channel to and from the Norfolk docks, wharves and piers approximates \$800,000,000.

Standing side by side with harbor and transportation facilities in its effect upon the growth and importance of Norfolk is the wonderful agricultural country by which it is surrounded. According to the statistics of the Government Agricultural Department the 100 square miles of land within which Norfolk lies produces annually crops of greater pecuniary value than any other 100 contiguous square miles in the United States or Canada. This constitutes the famous Norfolk-Portsmouth trucking section, from which is produced the green food supply of a large part of the North and West, and from which were sent out during the year 1912 the great aggregate of 5,000,000 packages, valued at \$15,000,000. One of the items of this stupendous production was potatoes, of which more than 1,000,000 barrels were shipped. The other items were made up of 39 different fruits and vegetables in varying quantities. Yet with all this tremendous output the potentialities of the Norfolk section have been little more than hinted at, and there are thousands of acres of lands equal to the best now in cultivation that still lie idle and unused, awaiting the touch of the husbandman to awaken them to prolific and profitable production.

As a commercial and manufacturing center Norfolk has long been important, and has in the past few years grown much more so. There are now within the Norfolk manufacturing zone some 350 manufacturing plants of many varieties and ranging in size from those with very few workmen to those employing them by the hundreds. The capital invested in these concerns aggregates \$20,000,000, the working force totals 13,500, and the annual products are valued at \$40,000,000. Among them are knit goods of various kinds, silk, iron articles of many kinds, fertilizers, lumber, cutlery, farming implements, bricks, carriages and wagons, butter dishes, paper boxes, veneer vegetable barrels, crates and boxes, wines and confectioneries. There is room for many more plants of these and other kinds, and those using power in large quantities will find coal cheaper at Norfolk than at any other im-

portant seaport in the country. There are shipped from Norfolk annually for outside consumption:

Peanuts, 2,700,000 bags, valued at.....	\$6,600,000
Fertilizers, 275,000 tons, valued at.....	5,400,000
Cotton, 655,000 bales, valued at.....	32,000,000
Coal, 10,000,000 tons, valued at.....	25,000,000
Lumber, 700,000,000 feet, valued at.....	21,000,000
Oysters, crabs and fish, valued at.....	3,000,000
Vegetable foodstuffs valued at.....	15,000,000

Norfolk is not only the greatest trucking center, it is the world's greatest peanut market as well, and the second largest coal port. With the completion of the coal piers now under construction it will become the largest coal port in the world.

As a wholesale market also Norfolk's position is an important one, and a number of houses do a big business, sending their traveling men out to cover a wide expanse of territory, which is being further widened year by year. The aggregate sales of these houses are very large. The superb facilities for handling freight, both in and out, render the city an exceptionally favorable place for the jobbing business, and there are inviting openings for still other houses engaged in various lines.

A city carrying on vast commercial and industrial undertakings must be well provided with banking facilities, and in this respect Norfolk measures up to the requirements. It has 13 banks, State and national, which make the following combined showings for the past three years:

Year.	Capital and Surplus.	Deposits.	Clearings.
1910.....	\$6,173,591	\$18,613,592	\$158,618,952
1911.....	6,347,370	20,892,149	168,618,587
1912.....	6,585,119	23,001,927	189,997,676

The building operations increased from \$95,800 in 1900 to \$3,393,677 in 1912, and taxable values rose from \$65,619,700 in 1911 to \$67,206,480 in 1912.

The United States Government maintains a navy-yard on the south branch of the Elizabeth River at Norfolk, which is considered one of the most important, strategically and otherwise, on the Atlantic seaboard. Among its equipment are three immense drydocks, the largest of which can care for the biggest battleship afloat. The navy-yard represents an investment by the Government of \$9,000,000, and employs constantly some 3000 men. In connection with it is the St. Helena training school, through which pass about 42 per cent. of the apprentices enlisted in the United States Navy. The marine hospital, soon to be improved by the expenditure of \$2,000,000, is another important adjunct. It is the well-defined intention of the Government to fortify the entrance to Chesapeake Bay by the expenditure of at least \$3,000,000 in erecting fortifications at Cape Henry, 17 miles from Norfolk.

Norfolk was founded in 1682. By 1840 it had grown till it had 10,920 inhabitants, by 1880 to 21,966, by 1900 to 46,624, and a careful estimate in 1912 showed it to have a population of 83,044. It is estimated further that within a radius of 15 miles from the center of the city there are now 130,000 people.

The progressive spirit of Norfolk finds expression through a large and well-organized Board of Trade, with a membership embracing the leading business men of the city, and "The Board of Commercial and Industrial Interests," commonly called "The Industrial Commission," a body of eight members maintained by the city for the purpose of advertising its advantages to the world and looking out after its general welfare from a commercial and industrial point of view. Any desired information about Norfolk will be furnished by the Industrial Commission.

As a place of residence Norfolk offers many attractions—good schools, handsome and well-attended churches, beautiful homes, and an intelligent, refined, hospitable citizenship. The climate is delightful, the average temperature being, for spring, 57; for summer, 76; for autumn, 61; for winter, 42. Seven seaside resorts are within easy reach of the city by boat or trolley, with many attractions during the season. In fact, Norfolk is a city of surpassing attractiveness, viewed from any angle.



# The Textile Center of the South is

**T**HE marvelous growth of the South in late years as so graphically told in this publication is aptly illustrated in a specific case by the development of Greenville, S. C., a city of 35,000 inhabitants. It is a city of many and varied activities—agricultural, civic, educational, financial, industrial and railroad. Its general progress in every line of activity is indicated in the fact that its population during the last ten years has increased 70 per cent.

Located at the foothills of the Blue Ridge Mountains, in the very heart of the Piedmont section, with an altitude of 1054 feet, rainfall of 52 inches, a mean annual temperature of 59 degrees, Greenville has as fine a climate as is to be found anywhere. It knows no extreme changes in temperature, the humidity is low, and the atmosphere not too rarefied by excessive altitude. The water supply comes from springs near the top of Paris Mountain, seven miles away, and is distributed throughout the city by a gravity system. The supply is five times the ordinary demand, and is very pure.

## Living Conditions.

The Board of Health inspects all dairies, examining the milk from each at least once a month. No hog or other animal may be sold within the limits of the city without being inspected before and after killing at the City Abattoir, which is under its direct supervision. There is rigid inspection of all fruitstands, green groceries, restaurants and hotels, and all food that is diseased, or for any reason unfit to eat, is condemned and destroyed. All imported meats are examined immediately on arrival.

Greenville's death rate of 14.3 per thousand—all ages—tells the story of its exceptional healthfulness.

Several years ago the Municipal League employed Mr. Harlan P. Kelsey of Boston to work up a plan for a system of parks, boulevards, playgrounds, civic centers, etc. Since that time the Park and Tree Commission of the city has been carrying out these plans, and now the city has a park that is fast developing into a place of beauty and a recreation center for the city's growing population.

During the past six or eight years there has been a large extension of the sewer system and of street paving. Though the city will have spent nearly \$700,000 on these improvements since September, 1910, when the work now under construction is completed, the citizens are urging a steady enlargement of sewerage and street work, in order to have the very best.

The public school system of Greenville embodies all grades up to and including a good high-school course of four years. In addition, there are two preparatory schools under denominational supervision and two business colleges. The schools in the cotton-mill villages around the city are well equipped and well attended with 1500 pupils, under the instruction of some thirty teachers. These schools are run on a co-operative basis, the mills supplementing funds secured from the county, thus insuring instruction for nine full months without interruption. These schools have libraries, some have kindergartens, and in others the pupils are taught cooking, sewing, woodwork and manual arts of various kinds. In addition, in some of the villages, through their Young Men's and Young Women's Christian Associations, night classes are conducted in textile work, domestic arts, etc.

There are in the city three institutions of collegiate rank, namely, Furman University, for boys, and Chicora College and the Greenville Female College, for girls. These institutions draw patronage from South Carolina particularly, but also from throughout the Southeastern States, and are rapidly growing.

The Greenville Female College and Chicora College have both more than doubled in the past ten years. Coupled with the many activities of the Young Men's and Young Women's Christian Associations and forty-seven churches, they have served to create a strong moral sense throughout the city.

According to the United States Bureau of Labor, the cost of living in South Carolina is lower than in any other State in the Union. This fact, together with Greenville's fine, bracing climate, her jealous regard for civic improvement and her unusual educational advantages, are especially attractive considerations to those who seek places of residence in which the living conditions are most inviting.

## Building For the Past Fifteen Months.

Building in Greenville has gone forward by leaps and bounds during the past three years. The permits for 1912 exceed in amount those for 1911 by 16 per cent. Nearly 50 per cent. of the total was for residences. The following table shows the business and industrial buildings begun or completed in the past fifteen months:

Imperial Hotel.....	\$75,000 00
Duncan Mill.....	1,125,000 00
Westervelt Mill.....	1,125,000 00
Brandon Mill (addition).....	500,000 00
Carolina Mill (addition).....	400,000 00
Woodside Mill (addition).....	500,000 00
Piedmont Bonded Warehouse & Comp. Co..	125,000 00
Virginia-Carolina Chemical Co.....	200,000 00
G. S. & A. Electric Line Station.....	20,000 00
American Machine Co.....	75,000 00
Southern Bell Telephone Co.....	125,000 00
Pinckney Street School.....	35,000 00
Greenville Female College.....	50,000 00
Baptist Courier.....	5,000 00
Methodist Advocate.....	5,000 00
Sirrine Building.....	10,000 00
Elks' Club.....	10,000 00
Rowley-Miller Building.....	5,000 00
Gower-Houston Building.....	12,000 00
Ice Plant.....	60,000 00
Main Street Bridge.....	50,000 00
Two Miles City Railway (Electric).....	20,000 00
Finlay Building.....	60,000 00
Davenport Building.....	20,000 00
Wallace Building.....	50,000 00
Carolina Phosphate Co. Plant.....	100,000 00
Furman-Gassaway Building.....	50,000 00
Arcade Building.....	25,000 00
Miscellaneous.....	250,000 00
<b>Total.....</b>	<b>\$5,987,000 00</b>

## Agriculture in Greenville County.

Agriculturally, Greenville county is extremely well located. From the northern portion, reaching into the Blue Ridge Mountains, the land slopes gradually, until in the south it is gently rolling. The entire county is well drained, and underground streams give a supply of water at a reasonable depth. The land is clay foundation, with a light loam surface.

A wide variety of crops are grown: cotton, any staple crop raised elsewhere in the South, all grains, etc. Corn, wheat and oats are the principal grain crops, and all yield abundantly. In the boys' corn-growing contests yields from 113 bushels down have been made and handsome profits secured. During 1912 several boys grew more than 100 bushels an acre at an average cost of about 35 cents per bushel. Cotton produces from one-half to two bales per acre, short staple, but the farmers are growing the upland long staple more and more, and thereby realizing from 4 to 6 cents per pound premium.

## GREENVILLE FACTS

POPULATION: 35,000.

ALTITUDE: City, 1040 feet; Paris Mountain, 2054 feet. Mean annual temperature: 59, lowest in the State.

POSTOFFICE RECEIPTS, (exclusive of Money Orders):

1910.....\$55,000  
1912.....69,000

PUBLIC SCHOOLS: 6 buildings, property worth \$125,000; 51 teachers, 3000 pupils.

COLLEGES: Furman University (Boys); Chicora College, (Girls); Greenville Female College (Girls); Draughton's Business College; Perry's Business College; Sacred Heart Academy.

CHURCHES: White, 33; Negro, 14—Total 47. Four Y. M. C. A. and one Y. W. C. A. buildings.

WATER SUPPLY: From mountain springs on Paris Mountain piped about nine miles by gravity system to city. Daily consumption, 1,000,000 gallons; daily capacity, 5,000,000 gallons; 84 miles of water mains.

PAVED STREETS: 6 miles, 20 miles cement sidewalks, 28 miles sanitary sewers, 4 miles of storm sewers. When work now going on is completed, Greenville will have 10 to 15 miles of paved streets, 32 to 35 miles of sanitary sewers, and 30 to 35 miles of cement sidewalks.

ELECTRIC POWER: Saluda River Dam, 3500 H. P. Local steam emergency station of the Southern Power Co., 10,000 H. P. This Company has 110,000 H. P. actually developed in its whole system which extends through the Piedmont Carolinas, and is developing more.

COTTON MILLS: Greenville is the center of the Southern Textile Industry. Within 2 miles of Court House: 11 mills, \$10,000,000 capital, 600,000 spindles, 7000 employees, annual payroll of over \$2,000,000; 41 mills are controlled from Greenville.

BANKS: 10 banks in the city.

Capital.....\$667,000  
Surplus and Profits.....600,000  
Deposits.....4,000,000

ASSESSED VALUE of real estate in city for taxation purposes: \$6,500,000. Actual value estimated at \$55,000,000.

RAILROADS: Southern, Atlantic Coast Line, Greenville & Knoxville, Piedmont & Northern, Seaboard Air Line. Terminal or divisional headquarters for first four are located here.

FREIGHT RECEIPTS: Annually about \$2,150,000. This is about the same as Charlotte and about equal to that of Anderson and Spartanburg combined. Increasing month by month over 1912 about 30 per cent.



DUNEAN MILL, GREENVILLE, S. C. THE ONLY COTTON CLOTH MILL IN THE UNITED STATES HAVING INDIVIDUAL ELECTRIC DRIVE THROUGHOUT.

If you think of locating or investing in the South, read what is said on these two pages about

# Greenville, South Carolina

Probably the greatest agricultural opening is in live-stock. Farmers can graze their stock almost all winter by growing clovers, vetches, rye, rape and similar crops. Bermuda, blue, Italian rye and various other grasses afford an abundance for summer grazing. Hogs have been produced here weighing 400 pounds at 8 to 12 months at a cost of 2½ to 4 cents per pound, which sell at 7½ to 10 cents per pound on foot.

In the southern portion of the county the farmers import beef cattle from North Carolina and Tennessee, feed them from 90 to 120 days, and then sell them in the Northern markets. While they make an actual profit on the gain in weight of the cattle, the main object is to enrich their lands by returning the barnyard manures. By this process they have increased the value of their lands five and sixfold.

No section is more suitable for dairying than Greenville county. The cattle tick, which has had such a detrimental influence on dairying and cattle-raising over the South, has been eradicated from this county, and Greenville has been pronounced free by the Federal authorities. Dairy products yield handsome profits; and the railroad facilities are such that shipments can easily be made as far north as Washington.

Almost all kinds of fruits, except tropical, can be grown in Greenville county. In the northern portion apples of fine flavor and good keeping qualities can be grown, and there is a great opening for this industry. Peaches, plums, apricots, cherries and other fruits do well. Practically all vegetables are easily grown, and the opportunities for truck farming are good. This is especially true in view of the large industrial population of Greenville which can be reached without shipping expense.

## The Textile Industry.

Greenville is now the real center of the Southern textile industry. This is true from the standpoint of railroad mileage. From Greenville to Lynchburg on the north is 314 miles; to Montgomery on the west, 335 miles; to Savannah on the south, 253 miles; to Raleigh on the east, 281 miles.

It is true also with regard to the extent of textile manufacture. At the close of 1911 the five States of Alabama, Georgia, South Carolina, North Carolina and Virginia had 93 per cent. of the spindles and 94 per cent. of the looms of the entire Southern States. South Carolina alone had 36 per cent. of the spindles and 43 per cent. of the looms of the fourteen Southern States. During 1912 the Greenville mills expanded their capital by \$2,250,000. The last report of the South Carolina Commissioner of Agriculture, Commerce and Industries shows that in 1912 in eleven counties of the Piedmont section of South Carolina, no point in which is more than 75 miles from Greenville, there are over \$62,750,000 invested in plants, operating 3,250,000 spindles and over 71,000 looms, consuming over 600,000 bales of cotton annually. These figures mean that within 75 miles of Greenville is concentrated 75 per cent. of this State's textile industry.

Greenville is central in view of the number of mills controlled from this city. The presidents of 41 mills live in Greenville, and here are located the purchasing departments of 48 mills, with a total capital of \$27,000,000, operating 1,700,000 spindles and 41,000 looms. The largest single buyer of textile machinery and equipment in the Southern States lives in Greenville. He buys for practically 2,000,000 spindles, in addition to those above referred to. The extent of his operations are suggested by the fact that last year he bought \$1,000,000 worth of electrical equipment alone.

Several important facts result from this concentration:

(1) This city gets an abundance of the best textile labor, for which living conditions are made especially attractive by the welfare work of the mills. The very healthful climate enables the operatives to do more and better work here than in other factory centers.

(2) The large machinery houses and other concerns catering to the textile trade are more and more moving their Southern sales offices to Greenville. The Saco-Lowell shops have just opened offices here; the Southern business of the Barber-Colman Company is all handled through Greenville now. The Chamber of Commerce is negotiating with several other concerns, some of whom have already definitely decided to come to Greenville.

(3) To the industry based upon cotton-mill products, whether main, subsidiary or waste, Greenville affords an abundant supply of raw materials. These arguments are borne out by the recent closing of negotiations by which a plant will remove to Greenville from another State; by the successful operation of the Nuckasee Manufacturing Co., making men's underwear; by the

large business of the Hobbs Dry Goods Co., the Osceola Commission Co., the Wilson Company, the Greenville Cotton Mills Co., selling mill products, etc.

Greenville is one of the largest inland cotton markets in the Southeast. The annual cotton receipts amount to 113,000 bales, of which about 13,000 come by wagon and 100,000 by rail. This means that actually 113,000 bales of cotton are annually sold in Greenville, of which the local mills consume 65,000, while 48,000 are reshipped to other points.

Greenville is also central to the cottonseed-oil mill industry of this State. Five of the seven counties having \$150,000 or more invested in this industry in 1912 are in the Piedmont section. In eleven counties in this portion of the State there are 59 mills.

The American Machine & Manufacturing Co., one of Greenville's largest industries, is making a specialty of cotton oil mill machinery. This company has just opened sales offices in Dallas, Tex. It covers not only the South, but does an international business as well. Contracts for several carloads of machinery, some of which have been shipped, while others are being made, have recently been closed for plants in Mexico and Peru.

Greenville is one of the leading points of the State for the following manufactures: Clothing, glass, tobacco and cigars, electricity, fertilizers, flour and grist, foundry and machine shops, ice, mineral and soda waters, lenses and optical supplies, mantels, fixtures and hardwood finish, flour, extracts, foundry and machine shop products, etc.

## Transportation and Financial Facilities.

Greenville is on the main line of the Southern, New York to New Orleans. It is the northern terminus of the Southern's South Carolina system; northern terminus of the Atlantic Coast Line's South Carolina system; terminus of the Greenville & Knoxville, now under construction to Knoxville, Tenn., and is the northern terminus of the Greenville, Spartanburg & Anderson. These various systems, running north, east, south and west, give Greenville an excellent passenger service of 56 trains daily.

The Greenville, Spartanburg & Anderson Railway, a high-speed electric freight and passenger line, has been completed from Greenwood and Anderson to Greenville, a distance of 70 miles, and construction is now under way from Spartanburg to Greenville. This line will eventually cover the entire Piedmont section of the Carolinas.

The early completion of the Greenville & Knoxville Railroad is assured. This will be the shortest road from Ohio River points and the West to deep water at Charleston, Port Royal and Savannah.

Traffic officials of the lines serving Greenville have assured the Chamber of Commerce that they will do everything possible to place Greenville on a

parity, so far as freight rates are concerned, with competitors in other points. The extensive developments in the way of industrial tracks, warehouses and terminals, together with such announcements as that of the Charleston & Western-Carolina (Atlantic Coast Line), that it will spend \$2,500,000 in the immediate future to take care of increased business, shows the railroad future of this city.

The city has nine banks, with capital, surplus and profits of \$1,500,000 and deposits of \$4,000,000. Deposits have increased 75 per cent. in the past four years. Bank clearings are steadily increasing, until now they amount to about \$40,000,000 annually.

This city is the home of four insurance companies: the Home Fund Life, the Southeastern Life, the American Home Fire, and the Mountain City Fire Insurance Co. These companies are controlled by local capital and managed by local people. They are

keeping Southern money in the South, and are lending a great deal for various forms of development in this territory. Their rapid growth assures Greenville's becoming a leading insurance center.

The Chamber of Commerce of Greenville is an aggressive commercial organization that is constantly working for her development. The membership comprises the leading business men and interests, and it is their spirit of "Work Together for Greenville's Good" that is very largely responsible for Greenville's rapid development. While Greenville is anxious to secure new capital, new people and new industries, it is especially interested in securing those that will reasonably prosper here, and that will not come until satisfied with the special inducements this city offers to them in the way of future business, living conditions, railway facilities, etc.

## GREENVILLE NEEDS

A million-dollar bank.

Industries related to textiles:

Ladies' underwear, waists, cotton

dress goods, etc.

Shirt factory.

Bagging factory.

Reed and harness factory.

Tannery.

Paper box factory.

Woodworking plants.

Department stores.

Apartment-houses.

Wholesale dry-goods, notions and shoe houses.

Expansion of

Livestock raising.

Dairying.

Fruit growing.



WOODSIDE COTTON MILLS, GREENVILLE, S. C.

When additions now under construction are finished this will be the largest complete cotton mill plant in the United States under one roof.



# The Electric City: Anderson, South Carolina

## The Center of Industrial and Agricultural Activities

**T**HE city of Anderson, in the highlands of South Carolina, makes the claim to being one of the most attractive places in the United States for homeseekers and settlers. In addition to the charm of a bracing climate, Anderson is one of the manufacturing centers of the Piedmont belt, and is also in the county that produced the largest yield of cotton in the United States—88,000 bales of short staple and 3900 bales of long staple—in the season of 1911-12. The average yield is about 70,000 bales a year. And there are in Anderson county nearly enough spindles to make all of this virgin lint into cloth of many kinds and grades of usefulness.

Within the city limits of Anderson are nine cotton mills having an aggregate capital of nearly \$4,000,000, and in the county there are six other mills with a capitalization of \$2,831,000. The following table will be of interest:

Name.	Capital.	Spindles.	Looms.
Anderson Cotton Mills.....	\$800,000	71,392	1,844
Brogan Mills .....	657,400	27,780	900
Conneross Yarn Mill.....	75,000	11,200	....
Cox Manufacturing Co.....	350,000	25,000	400
Gluck Mills .....	450,000	32,000	672
Orr Cotton Mills.....	800,000	62,272	1,500
Riverside Manufacturing Co.....	386,250	20,272	....
H. C. Townsend Cotton Mill.....	115,000	5,016	....
Toxaway Mills .....	345,375	28,000	724
	\$3,979,025	282,932	6,040

Other cotton mills in Anderson county are:

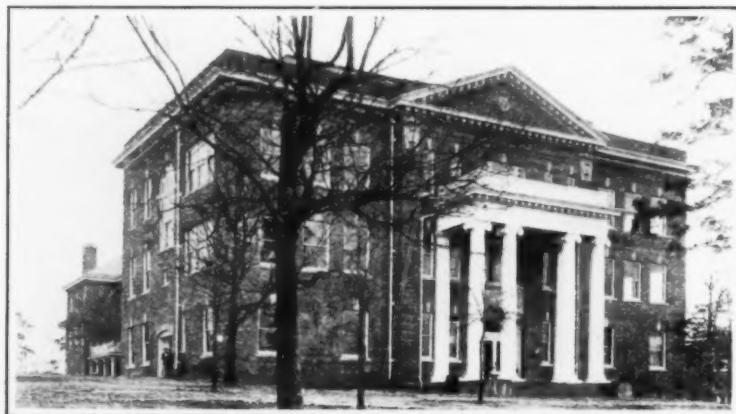
Name.	Capital.	Spindles.	Looms.
Belton Mills .....	\$700,000	58,392	1,394
Chiquola Manufacturing Co.....	358,000	41,280	1,000
Jackson Mills .....	350,000	21,504	640
Pelzer Manufacturing Co.....	1,000,000	135,000	3,100
Pendleton Cotton Mill.....	123,150	15,754	....
Williamston Mills .....	300,000	32,256	816
	\$2,831,150	304,186	6,950
Cotton mills in Anderson.....	3,979,025	282,932	6,040
Total for county and town.....	\$6,810,175	587,118	12,990

The nominal capitalization of the cotton mill industry in Anderson does not represent the amount invested. Pelzer, for instance, is capitalized at \$1,000,000, and has an investment of \$2,000,000. The total amount invested in all manufacturing enterprises in Anderson county is \$12,500,000, including additions now under way, and the total value of the output is \$12,600,000.

The annual output of fertilizers is \$540,000; of the cotton-oil mills, \$617,000, and of cotton mills, with the increases expected this year, \$10,600,000. In mill communities in Anderson county are 16,000 persons, 5700 of them employees. The output of the machine shops of the county is valued at \$140,000.

Anderson has always had a steady, sure and upward-development. The prospect is that this growth is sure to be greater in 1913 than in any other year in the history of the Electric City. In 1912 the business men here built Anderson College, representing \$165,000 of local money, and completed the Anderson County Hospital, one of the best equipped institutions in the United States. A male academy for boys was built, the Frazier Academy. A separate hospital for the negroes, an additional school for the negroes and another for the whites are planned.

Among the other big enterprises under way in Anderson for the approach-



ADMINISTRATION BUILDING, ANDERSON COLLEGE.

ing building season are a theatre, a passenger station for the Blue Ridge Railway Company to cost \$75,000, a passenger station for the interurban electric railway, known as the Piedmont & Northern, which last year spent nearly half a million dollars in Anderson. Should the Southern Railway Company,

which owns the Blue Ridge, build it to Knoxville, Tenn., Anderson would be the first important stop between Columbia and Knoxville.

Anderson comes honestly by her sobriquet, "The Electric City." This is the first city in the United States to which electricity was delivered from a distance. The first power plant of this kind was built at High Shoals in 1894 by William C. Whitner, and the power conveyed to Anderson for the operation of a lighting system. The success of this enterprise stipulated other operations, and the very next year the great power development at Pelzer and the adding of a big new mill followed the High Shoals successful experiment.

William C. Whitner and William S. Lee, both of Anderson, gave impetus to the building of the great electrical power development known as the Southern Power Company. Mr. Lee is now the active head of that company in the field, and has promoted the Piedmont & Northern Railway Company. This is a development of an Anderson project. A few years ago Anderson started a local electric railway line and it paid well. As a result the promoters extended the lines to Belton, 10 miles distant, and the Anderson to Belton line



COURTHOUSE, ANDERSON, S. C.

was the first link of the chain which now extends from Greenwood to Greenville. This line, backed by the leading capitalists of the American Tobacco Company, promises ultimately to cover with a network of lines much of the Piedmont section tributary to Anderson and the other industrial centers of the Carolinas, and will probably be extended to Atlanta.

Anderson is a most attractive section for the health and home seeker, for the investor, and the manufacturer desiring an advantageous location for the establishment of new enterprises. The surrounding country offers unusual advantages to farmers seeking a Southern home.

Two of the strong assets of Anderson are the fertility of the country and the exceptionally high class of farmers. The most modern farming machinery is used, and throughout the county are evidences of the most improved methods of fertilization and crop culture. The combination of soil and climate in this favored section permits the raising of two or three crops on the same ground during the same year. Many homes of the farmers have every modern convenience of city houses. The automobile as a pleasure and business vehicle is in evidence everywhere throughout the county.

Though Anderson county is one of the foremost cotton manufacturing centers of the South, cotton manufacturing does not absorb every industrial interest. The town is admirably located with relation to other raw materials, and other factories have been established here and have proven as successful in their operation as the cotton mill industry. Every advantage of favorable climatic conditions, of an abundance of cheap power available from the large hydro-electric developments throughout this section, and a large labor supply of the highest quality, make this an exceptionally attractive place for the widest diversity of industrial operations. There is probably no place where labor conditions are better. The working people are largely native Anglo-Saxons with inherited traits for industrial employment. They are intelligent, industrious and ambitious.

In addition to the strong position of Anderson with respect to transportation facilities and the rich surrounding country, it has large banking facilities for carrying on extensive operations. There are seven banking institutions here with resources of approximately \$3,000,000, and a dozen or more at other points in the county. In addition to existing railroad lines, it is quite probable that Anderson will be on the main line of the Piedmont & Northern in its projected extension from Greensboro, N. C., to Atlanta.

The Anderson Chamber of Commerce was recently organized with a large membership for the purpose of making the advantages of the city and county known to the world. A campaign of publicity will soon be under way. The organization will have as a part of its staff an expert agricultural secretary, who will work in connection with the Farmers' Unions of the county looking to a still further bettering of agricultural conditions and the diversification of farming, and at the same time more firmly cementing the ties of friendship and interest which now bind the town and county together.

From a past of distinguished performances and a present of full prosperity, Anderson looks joyfully forward to a future of progress.

# A Typical Southern Woman's College--Converse

(A descriptive letter, supposed to be written by an uncle to his niece who expects to attend College.)



Y Dear Elizabeth—Remembering that you expect to enter college next fall, I have incidentally, during my trip through the South, made observations upon some of its schools for young women with the hope of aiding you in your decision. Among the four or five institutions of this kind—I mean schools that do real college work—I was particularly struck with what I heard of Converse College. It seems to have a rare individuality, a unique place in the public mind, and one is impressed by the intense loyalty of its graduates—a loyalty due not merely to their admiration for its educational standing, but especially to their affection for the place itself.

You have heard of the rapid growth of cotton-cloth manufacturing in this Piedmont section of the South, and it is interesting to hear that Converse College is in a sense the product of the idealism and liberality of the pioneers in this movement. Mr. D. E. Converse, for whom the college is named, and those who co-operated with him in its establishment were pre-eminent as leaders in the new industrialism, and the present trustees are nearly all connected with cotton mills as presidents, directors or stockholders.

Now, I do not wish you to imagine for a moment that Converse is itself an industrial school. If I were to characterize it at the beginning of my description, I would emphasize its broad, open-minded and open-hearted cultural policy, free from fads and whims and transitory "isms" of every kind. It is concerned primarily with doing its work in the best way with the best spirit, under the best conditions, believing that this will do more to keep its graduates capable of straight thinking, pure feeling and effective doing than wild preachments and daring experiments.

I like its balance, combined with a careful progressiveness—its grip on the best things in the past and its outlook toward the best things for the future.

You are doubtless familiar with the oft-repeated accusations against women's colleges, viz., that nothing is done to produce good home-makers, and that college-bred women (as well as men) do not "connect up" instantly and easily with present day world-life. Some of our high-grade institutions are endeavoring to meet these criticisms by introducing and emphasizing courses in domestic science, the industrial arts and business. To my mind, this is rather a superficial remedy if administered alone. The trouble does not lie chiefly in a lack of knowledge of these things, though surely a scientific understanding of them will not be amiss; but fundamentally in failing to keep in touch with them during one's residence in college. Ordinarily a young college woman spends four years of her life, when she would naturally be equipping herself for her domestic and social affairs, in an environment that is foreign to such interests in the form in which she will encounter them afterwards. Her surroundings in college smack of hotel, club, convent or common boarding-house living, and her spirit, manner and ideals assume a type and tone that do not suggest the rest, comfort and gentle renovating power of the model home. The problem, then, is, in addition to such instruction in the classroom as will give her an intelligent insight into the constructive side of domestic activities, to keep her in hearty sympathy with the life itself. It is this policy at Converse that impresses the visitor at once. Its furnishings, adornments, arrangements of every kind, while not lavish or luxurious, are such as might be duplicated in any well-ordered home, and are at the same time models of good taste. These matters are in charge of a Dean, who might aptly be termed the professor of domesticity.

The relations between the officers and students are simple, unaffected, kindly, thoughtful and mutually helpful. A frankness, an unsuspiciousness, an unconsciousness of self, dominate the institution, and make one feel that she is in a normal, sane and socially helpful atmosphere. From the moment you enter the halls you are received with a quiet, sincere, friendly welcome, wholly without display, as if you had always been an inmate of the home and were only coming in to occupy your accustomed place. The same attitude toward you continues throughout your school career and thoroughly accords with the note of simplicity and quiet dignity suggested by its interior appointments.

The general life of the institution is also affected by its happily chosen location. When a college is almost entirely isolated, either by its secluded situation or restricted policy, from the great world outside, scope is given for distorted and contracted views of things, the cultivation of mannerisms, and sometimes of dangerous and unsound philosophies. The mania "just to be different" develops a type of young woman who does much by her absurdities to make well-balanced people doubt the value of the higher education. Converse is in the residence section, a mile and a quarter from the heart of a beautiful city of 25,000 people, who insist on having neatly kept and well-paved streets, up-to-date buildings, the best public utilities—in other words, the material appointments of a modern town—and better still, many of them being graduates of either Converse or Wofford (a college for young men at the other end of the place), they are noted for their literary and artistic activities and for their church-going. The college buildings occupy almost the center of a campus of over 50 acres, and while the grounds are surrounded by residences and fronted by a street-car line and a boulevard, it has an air of "keeping its distance," and partakes of the quietness of its groves while it retains a subconsciousness of its vital connection with community affairs. This is partly the explanation of the tone of genuineness in the girlhood of Converse students. They are not recluses or bluestockings or spectacled investigators of the noxious and the curious, but simply straightforward, sensible and graceful maidens, unconscious whether they do or do not belong to the great world and confident that they have nothing against it and that it

can have nothing against them. Consequently I was not surprised in traveling through the South to find them falling into their places in the home, the church, the Sunday-school, the social circle, even the business houses, as if it were the thing to do, without doubting their ability to cope with new situations, even though without any specific professional training for them, and yet without crudeness and awkwardness.

Some of this, I think, is due to the splendid type of young woman the college manages to attract to its halls. It does scarcely any active soliciting of students, and being absolutely undenominational (its charter makes it independent of Church or State), it cannot expect the clergy or ecclesiastical assemblies to help it. It does its work steadily, unostentatiously and conscientiously, and maintains its registration almost solely through the loyal efforts of its former students. Nevertheless, it has a constantly growing area of patronage, stretching from New York to Texas and from Colorado to the Atlantic Seaboard, and fills its dormitories (accommodating from 175 to 200) with representative young women from all these sections.

My letter is growing so lengthy that I can barely sketch some other salient features. For one thing, your parents can entrust you to the Converse people and feel confident that they will take good care of your body. The climate itself is a benediction, so well-balanced and exhilarating, almost entirely free from extremes of cold or heat, and outdoor sports of all kinds adapted to young women are a part of the program. But the thing that commended this side of the college to me is the ample provision made for the personal supervision of the students' physical welfare. A good physician resides in the buildings, a trained nurse presides over the infirmary, and a physical director, a product of the best schools of the kind in America, utilizes the large and well-furnished gymnasium for the purpose of promoting health rather than athletic ability and prowess. I have seldom enjoyed as good table fare in the best hotels as was served me in the Converse College dining hall.

At the close of the meal I was intensely interested in hearing a number of announcements made by young ladies in different parts of the room, all of them referring to student government and Y. W. C. A. affairs. For you must understand that student government at Converse is one of the first ventures of the kind made by any Southern college, and has proved itself to be not only most efficient in producing an ideal student life, but is itself a most potent educative factor. And the Y. W. C. A., embracing nearly every inmate of the household, conducting its Bible and Mission Study classes and doing both home and foreign mission work, makes itself felt in every college activity, and, bringing together girls of every leading church upon a platform of practical religion, is a telling example of Christian unity.

What is the standing of Converse among the women's colleges of the South? This question doubtless has been lingering in the back of your consciousness all this time and I will try to answer it. The Southern Association of Colleges limits its membership to those institutions of the best type that require at least 14 units for admission to the Freshman Class and give standard college courses. There are just five colleges for women in the South that belong to the Association, and Converse is one of them. In examining into its policy and organization as a college, I wish to commend to you its "group system" of studies. It admirably solves the problem of giving you a mastery of one subject supported by a background of general culture. If you wish to make yourself a specialist, or fit yourself for a college position or prepare to do a specific service for your community, here in one of these groups you will find the well-laid ground work for subsequent university courses. It is the Johns Hopkins "group" idea rather than the Harvard "free election" idea.

Now, I have always contended that no woman can afford to underestimate the artistic element in her training. One thing seems to be settled, viz., that in America, however it may be otherwise in foreign countries, the gospel of the fine arts must be propagated by the women rather than by the men. And so Converse College has accepted this doctrine and has fostered the artistic both in spirit and in form. It gives its work in music, painting and drawing a strong cultural caste—interpretation is the invariable key to all of its activities of this kind—but makes these subjects vital and interesting, and its products will do credit to representative studios and conservatories anywhere. You have doubtless heard of its great Music Festival, which has been given every spring for over twenty years. It was the pioneer venture of this kind in the South, and although others have sprung up in its wake, it still maintains its supremacy. People from all over the South and musicians from the North and West attend it, and by examining its announcements you will see that the most noted soloists of all kinds in the world of music have been heard under its auspices. Its own choral work, tested by giving the classic oratorios and operas, is of the highest quality and reveals a freshness and vitality not often noted in the choruses of the best opera-houses.

Let me say, in conclusion, that the Spartanburg people and Converse College are singularly welded together. They started, under the leadership of Mr. Converse, by putting their money into it, and they have responded to its minor calls from time to time. But last summer they gave a signal instance of their devotion to it. The college needed \$100,000, and in a week the citizens of Spartanburg, aided by a half-dozen friends outside, responded with \$107,500. Every girl who comes to Converse is looked upon by Spartanburgers as a new member of a large and growing family. When she leaves for vacation the town is overcast with a gray haze, and when, in the orthodox lapse of time, she marries, they recall her face and name and secretly felicitate the fortunate fellow. It is a happy thing to be a school girl in a town where the people love the school girls for their own sake.



# The Wm. J. Oliver Manufacturing Company

## An Important Factor In Southern Development

**A**MONG the manufacturing concerns that are here and there achieving distinction in giving the South a broader and more significant development along industrial lines and making known its potentialities throughout this and foreign lands, that of the Wm. J. Oliver Manufacturing Co., at Knoxville, Tenn., occupies a unique place of importance. Its various products are finding their market not only in every section of this country, from the Atlantic to the Pacific, but in other countries as well, from Canada to Brazil, and even to far-off New Zealand.

The plant covers, with its yards and buildings, over forty acres. It is located on the tracks of both the Southern and the Louisville & Nashville railroads. It has shops of various kinds for the manufacture of the numerous kinds of products made by the company and for extensive repair work for contractors, mill men, coal mines and railroads. The principal buildings are the main shops, 572x166 feet; the foundry building, 418x134 feet; the wood-working shop, 280x160 feet; the grinding-room, paint shops, etc., a very large storeroom, pattern-house and spacious office building. The equipment is thoroughly modern, and embraces every kind of machinery needed in handling the various branches of the company's business. It is especially adapted to doing jobs of the larger kind, and some classes of work done here cannot be turned out elsewhere in the South. The machines are all driven by independent electric motors, the current for which is generated at the central power-house. The main building has two 50-ton electrically-driven traveling cranes, the foundry building two of the same character that are capable of handling 20 tons, and the woodworking shop one also of 20-ton capacity. In fact, the plant is built and equipped especially for the rapid and economical handling of work of the larger kind.

The Oliver company is engaged in manufacturing dump cars, railroad flat cars and general contractors' equipment, mine equipment, logging cars, quarry equipment, marble-finishing machinery and plows, and to do, in addition, a general repair work on engines, boilers and all other kinds of contractors' and railroad equipment.

In the matter of dump cars, it makes a specialty of the Oliver Two-Way Air Dump Car, a product that embodies the last word in contracting equipment. The regular sizes in which these cars are made are 12-yard, 16-yard, 20-yard and 30-yard, though other sizes are made to order when preferred.

These sizes are standard-gauge cars, built according to M. C. B. specifications throughout and equipped with government safety appliances. They are moved on their own wheels from place to place. The other standard-size cars manufactured are the 4-yard and 8-yard 36-inch gauge used by contractors and industrial plants. The improved Oliver 4-yard car, which is built with one of the strongest trucks, has been pronounced by a great many of the leading contractors as the best 4-yard car on the market.

The Oliver double-truck 8-yard car, 36-inch gauge, has also proven itself to the contractors to be far superior to any other car built where they have long hauls. Other sizes and types of cars are also built as ordered.

The 12-yard and 20-yard air dump cars, which may be considered a standard car with railroads and contractors using standard-gauge equipment, have two draft sills consisting of 15-inch steel channels weighing 45 pounds to the foot, with a substantial number of separators, cover plates, etc., riveted up in a substantial workmanlike manner, eliminating all castings subject to the falling of rock and such material, and substituting in their place forgings and steel plates. These cars are equipped with any type of M. C. B. automatic couplers which the purchaser desires. The bottom of these cars is of 3-inch white oak, or can be of all steel if wanted, with 10-inch center channel beam 33 pounds to the foot, running full length of the body, and also has two intermediate 4x6x $\frac{3}{4}$  angle irons, and two outer angle irons of 4x6x $\frac{3}{4}$ , all running the full length of the bottom. Between the two intermediate angles are placed seven truss angles, distributed the entire length of the body. These trusses are made of 3x3 $\frac{1}{2}$ x5/16-inch angle iron. The outside angle is trussed by two 1 $\frac{1}{2}$ -inch rods with turnbuckles. The body of the car is pivoted to draft sills by nine hinges, which are securely riveted to the draft sills, and the top hinge casting riveted or bolted to the 10-inch center channel on the bottom of the car. These castings are pivoted together with 1 $\frac{1}{2}$ -inch steel pins. The ends of these cars are built of either 3-inch white oak timber or 5/16-inch steel plate, securely fastened to the bottom of the car, and are braced from the center by means of a malleable casting riveted to the end and to the center channel of the bottom. The doors are constructed of steel 3/16-inch plate, reinforced horizontally at top and bottom by two 6x4x $\frac{3}{4}$  angles, securely riveted to them, running the entire length of the doors, and between the two angles 23 Stiffener angles of 3x2 $\frac{1}{2}$ x

5/16-inch are used. The cars are equipped with either New York or Westinghouse latest improved air brake equipment. Trucks are of steel construction, according to M. C. B. specifications, with capacity to suit the different sizes of the cars. The capacity of these trucks is from 50,000 to 100,000 pounds.

The air dump cars are equipped with a cylinder hung upright on each side of car. The piston rod for the cylinder is fastened to the bottom of the car at one end and to the piston at the other. Two reservoirs are put on each car, being placed between the draft sills, which insures absolute protection against falling rock. Air is supplied to the auxiliaries from the train line pipe with a check valve between, thus preventing the air from returning from the auxiliaries to the train line pipe. A valve is placed on the end of each car, with pipe connections running from the auxiliary and from the valve to the dumping cylinder, and either of the cylinders dumping the car on the side which they want to unload, and releasing this cylinder and admitting air into the other one rights the car. This car is under absolute control of the operator, and he can stop the car even after it is past the center of gravity, which enables the user to dump in any quantity desired.

A feature of special value is the toggle or lever arrangement for dumping the car, by which the lower edge of the door is thrown upward and away from the contents of the car, thereby minimizing the liability of any materials striking against the door and springing or wedging it. The lever performing this function also locks the door rigidly when the car is standing in a horizontal position. This is one feature of this car that is thought to be unequaled in cars of other makes. It appears on all Oliver dump cars.

Only one line of pipe is necessary to operate both the air dumping device and the air brake. Cars thus equipped permit any locomotive with standard air brake equipment to operate the air brake cars without having to equip the locomotive especially for air dump cars. A train of Oliver air dump cars can be taken to the unloading or dumping place and the locomotive cut loose from the cars, and they will still have enough air in the auxiliary of each car to dump the same three times. Any laborer can handle the Oliver air dump cars with as much ease and safety and get the same result as a mechanic or expert. These cars are also equipped so that the locomotive engineer can dump the cars and right them from the locomotive.

This car carries a large load; it can be dumped by one man; it is substantially built, and will withstand rough usage; it is built according to M. C. B. specifications, permitting the user to secure repairs in any railroad shop. The air for dumping is applied directly to the car body. It is dumped either side and righted by the move of a simple lever on the end of the car or on the locomotive.

The Oliver two-way air dump car appealed so strongly to the Government's construction engineers that they ordered 1400 for use in the Panama Canal work. They were sent to the Isthmus in 1908, and have been giving general satisfaction ever since.

Other notable users of these cars are hundreds of contractors, the Utah Construction Co., the Utah Copper Co., the Chino Copper Co. of Utah, Florida phosphate companies, the Lehigh Valley, the Missouri, Kansas & Texas and other railroads, and also the Canadian Northern, which is building through Northwest Canada. An order for 50 cars has just been filled for the Brazil Railroad Co., Soro Santos, Brazil.

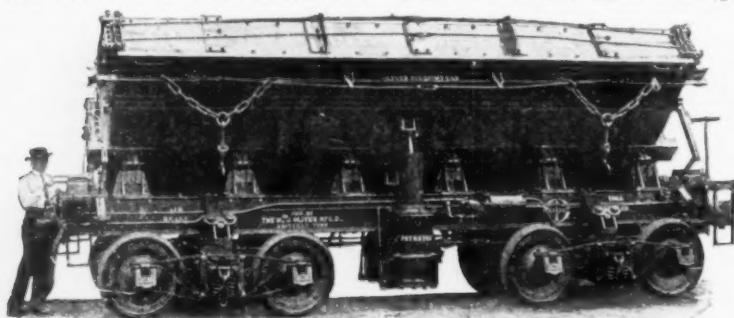
Dump cars of other types are made by the Wm. J. Oliver Manufacturing Co., but practically all of them bear the essential Oliver features described above, with such modifications as are suitable to their size and the particular purposes for which they are intended.

In mine equipment the company manufactures tipples, drums, screens, mine cars and monitor cars for coal mines, marble quarries and limekilns. These cars are all of special design, gotten up by experienced mining engineers and draftsmen.

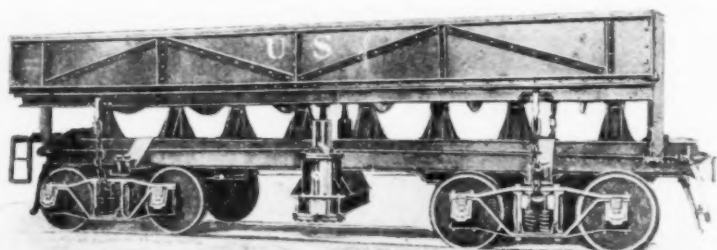
The equipment for marble quarries which the Oliver company makes embraces finishing machinery, rubbing-bed outfits, Hurst frames, derricks, and various kinds of special appliances needed in that character of business.

The plant is fitted for doing a general repair work in all the lines it manufactures, and many more besides, including steam shovels, locomotives and cars of all kinds.

Next to its special line of dump cars the most important part of the Wm. J. Oliver Manufacturing Co.'s product are plows, and first in importance among these is the special brand known as the Wm. J. Oliver Improved Chilled Plow. This implement combines within itself so many excellent features that it seems



12-YD. AIR DUMP CAR WITH STEEL UNDERFRAME AND WOOD BODY.



19-YD. ALL-STEEL AIR DUMP, FURNISHED THE U. S. FOR PANAMA CANAL

to have them all, and stands unequalled as an implement of husbandry made to meet all possible contingencies.

The making of plows was added to the business of the Wm. J. Oliver Manufacturing Co. in 1908, when it bought out the plant and business of the Ground Hog Plow Co. and proceeded to further improve this plow by features patented in 1909, after which it began to make plows in earnest and to lay plans for selling them. The excellence of the plows and a selling campaign waged with vigor and intelligence brought in a few months a phenomenal demand for the Wm. J. Oliver Improved Chilled Plow, and before long its use was nationwide. Within the last few months, indeed, the demand has overstepped continental limits, and a big shipment of plows has been sent to New Zealand.

The Wm. J. Oliver Improved Chilled Plow boasts a locking device that adds greatly to the strength of the implement and preserves its original shape during its life. This prevents the plow from becoming loose and "rickety" in the joints or untrue or out of alignment. It is absolutely simple in construction, and the boy on the farm can take it apart or put it together as well as the man in the shop. It "runs true" in the furrow.

It is the only plow made that has interchangeable parts. When the owner of any other make of plow breaks some part and goes to town to get a new one he must remember the number of his plow, or the merchant will not know what to give him. When the owner of the Wm. J. Oliver Improved Chilled Plow breaks a part he goes to the merchant who sells the Oliver and tells him what part it is he wants, and gets it. The dealer in the Wm. J. Oliver plow carries but one kind of extras—they fit all kinds of Wm. J. Oliver improved plows. The plows are made with both steel and wooden beams, and everything about them, from point to handles, and from mouldboard to clevis, is of the best material and the best workmanship. The company is making about 100 different varieties of plows, with an annual output close to 50,000.

As the product of any manufacturing establishment can only equal the sum of the knowledge of that product possessed by the men employed by that establishment, the personal factor must enter largely into the manufacturing equation. What, then, is the knowledge, gained from experience, possessed by those who are active in the management of the affairs of the Wm. J. Oliver Manufacturing Co.?

William J. Oliver, founder of the company, its president, and its presiding genius in fact as well as in name, is a member of the Indiana family which for two generations has made the name Oliver known wherever an up-to-date plow is appreciated. When he struck out for himself he came South and engaged in the business of building railroads, as a contractor, in which he had amassed a fortune of a million dollars before he reached middle life. He mastered the contracting business in all its details. He knew every nut and every bolt in every machine he used in his work, and when something wore out or broke he knew just how much it ought to cost to repair or replace it. Finding that he was paying too much for his repair work, he bought out a foundry and machine shop where he could repair his own machinery. With a thorough knowledge of the work required of the equipment for the contractor's business, he added from time to time improvements to the machines he hauled into the shops for repairs, and the consequence was that in the course of time certain things had been so often repaired and improved that they were more William J. Oliver products than the products of the plants which had manufactured them in the first place. This brought about the manufacture of such things in their entirety, with all the improvements which experience had suggested. In the matter of dump cars, for instance, Mr. Oliver knew the weakness and the strength of each individual part of each individual make of car, and each and every criticism made by his contractor friends and associates was considered. From this knowledge sprang the car which bears his name, and which has demonstrated its superiority from the Atlantic to the Pacific and from Canada to Brazil.

Mr. Oliver is president of the Knoxville, Sevierville & Eastern Railroad, and owner of the Savannah, Augusta & Northern Railroad, and connected with many other important business enterprises throughout the South. As a contractor he executed some of the largest contracts in the construction of railroads ever given to one man, and always with an expedition and a thoroughness that gave satisfaction to those who had the bills to pay. When the United States Government called for bids for the construction of the Panama Canal, Mr. Oliver was among the bidders who responded, and his bid was found to be the lowest and best. He qualified in every respect with all the requirements of the Government, and would unquestionably have been awarded the contract to do that great piece of constructive work had it not been that it was decided that the Government would itself do the work under the supervision of its army engineers.

Mr. Oliver, who is still on the sunny side of fifty, is an active, enterprising man, full of aggressiveness, and never so happy as when engaged in some great piece of constructive work that calls for the exercise of skill, energy and financial daring.

The vice-president and general manager of the Wm. J. Oliver Manufacturing Co. is L. E. Wooten, who began his business career at the age of thirteen as an apprentice in a railroad machine shop. Having served his term, he worked his way through the various positions in the shop, learning the details of car and locomotive construction, and then became a locomotive engineer before he was twenty-one years of age, with Mr. Oliver, on construction. From this position he became superintendent on some of Mr. Oliver's construction work, where he became fully conversant with the various kinds of equipment in use in such work. He afterwards served as general manager of the Savannah, Augusta & Northern Railroad, and then built the Knoxville, Sevierville & Eastern Railroad and operated it for some time. In these various positions Mr. Wooten became thoroughly familiar with dump cars of all kinds, and when, in 1908, Mr. Oliver secured the contract to deliver 1400 of his dump cars to the Isthmus of Panama for use in digging the Canal, he was selected by the superintendent of motive power on the Isthmus as superintendent of construction to erect the cars, which were shipped in a "knocked-

down" condition. In that capacity he served the Government for eighteen months, gaining a still deeper insight into the requirements for an efficient dump car and how to perfect its construction. When he returned to Knoxville he was made vice-president and general manager of the company, bringing to the duties of that position a practical knowledge of dump-car construction not equaled, perhaps, by that of any other man in the country. This knowledge, gained from experience in actual shop training, as well as in the practical operation of dump cars on construction work, Mr. Wooten is exercising, with all the energy of a highly-energetic nature, in keeping the output of the company up to the highest standard of excellence, and in adding wherever possible such things as may tend to the further perfection of what he believes to be the most perfect dump car now being made.

Thomas Price Roberts, superintendent of the shops of the Wm. J. Oliver Manufacturing Co., served his apprenticeship as a machinist in the shops of the Asa Blevin Manufacturing Co. of Elmira, N. Y., builders of stationary engines, etc. He went to Knoxville when still a very young man and connected himself with the Knoxville Foundry & Machine Co. as machinist, a position he held for ten years. Later he was connected with the East Tennessee, Virginia & Georgia Railway, and with its successor, the Southern, for twenty-one years as machinist, toolmaker, foreman and general foreman. From that employment he went to the Wm. J. Oliver Manufacturing Co. in 1905 as superintendent of shops, a position he still holds. Mr. Roberts has supervision of the shops and oversees the construction of all the cars and other articles turned out from them. To this work he brings the same ripe experience and the same attentive energy that have made him a valuable man wherever employed.

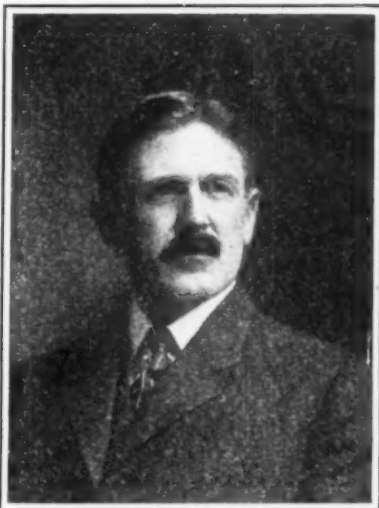
The head of the plow department is J. R. Rossetter, a man who has spent many years in the plow-selling and plow-making business, and who unquestionably knows as much about the practical construction of those very useful implements as any other man anywhere. After serving for seven years in a plow-manufacturing concern, learning every detail connected with the construction of plows, Mr. Ros-

setter conceived an idea for making an improved chilled plow. This plow he afterwards perfected, patented and manufactured for a number of years, until he sold his business and patents to the Oliver company. The original line has been considerably reinforced by the addition of plows of various other types, all of which embody the same patented features as the regular series of chilled plows. Mr. Rossetter has been at the head of the company's plow department since 1909, applying his knowledge and experience to turning out the best possible work, and always striving to find some way to improve an article that already seems to be well-nigh perfect.

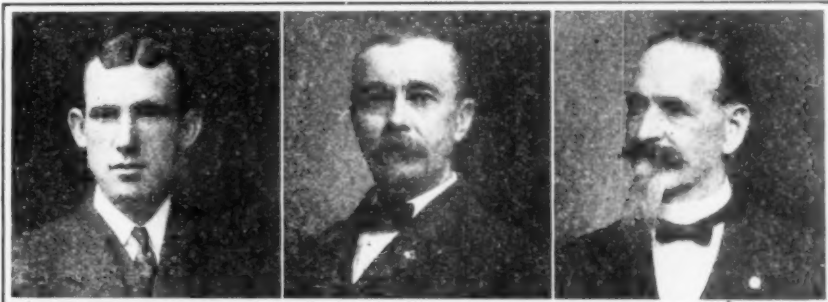
Thus it will be seen that Mr. Oliver not only is himself thoroughly experienced in the various lines of business to which his company is devoting itself, but, with the genius of the true leader of men, he has brought to his aid, and placed at the heads of the different departments of the plant, men of the broadest practical experience in their respective lines, to the end that whatever work is turned out of the plant shall be the best of its kind—made and finished in the highest state of perfection of which human skill and human ingenuity are capable—the product of brains and experience and inventive genius.

The motto the Wm. J. Oliver Manufacturing Co. works into the products of its plant is: Nothing but the best is good enough to bear this company's name.

The opportunities offered by the South to men of broad vision and energy for the creation of great enterprises are aptly typified in the history of the Oliver company. It is for this reason this story is published. Specific illustrations of what has been achieved in the South furnish the proof, if any were needed, to sustain the claims made in "The South: The Nation's Greatest Asset" as to the illimitable resources and possibilities of this favored land.



WM. J. OLIVER.



L. E. WOOTEN.

T. P. ROBERTS.

J. R. ROSSETTER.



# The Arkansas Colonizing Company

INCORPORATED

CREATED BY AN ARKANSAS WOMAN'S ENERGY AND BRAIN

## Lands



WITH the value of the products of its factories rated in 1912 at \$92,000,000; of its farms at \$168,375,000; of its forests at \$54,008,000, and of its mines at \$5,600,000, Arkansas shows a remarkable advance in general development.

Such a splendid showing could not have been possible had not Arkansas a soil and climate suitable to raising a wide range of products, vast forests of valuable timber, rich deposits of minerals in great variety, and all the needed advantages and requirements for manufacture.

Arkansas, agriculturally, is a wonderful State—a State in which the varying elevation from the Missouri line to the boundary of Louisiana gives it a sufficient number of degrees of latitude to enable farmers to raise semi-tropical crops and those of the temperate zone.

The advance in the value of farm products in Arkansas has been a notable one. In 1890 these were worth \$53,128,000; in 1900, \$79,649,000, and in 1912 they advanced to the splendid total of \$168,375,000, a complete and most convincing evidence not only of the richness and productivity of its soil and climate, but also of the increased attention which is being given to farming. Arkansas yields annually about 1,000,000 bales of cotton, valued at \$50,000,000 to \$75,000,000, and 60,000,000 bushels of corn, worth \$40,000,000. The growing of rice has also proven a very profitable industry in the State. Twenty years ago Arkansas was raising only a few hundred bushels, while last year there was a production of 3,405,000 bushels, valued at \$3,201,000. Ninety thousand acres were devoted to this crop, and the average yield per acre was 37.5 bushels, exceeding the average yield of all other Southern States. Conditions in Arkansas have likewise been found to be exactly suited for cattle-raising and dairy farming. Truck-growing has also reached large proportions, for this State is well situated in relation to the country's big consuming markets, and hundreds of carloads of vegetables of most every variety are shipped annually. Arkansas' orchards in the highland sections of the State are now famous for the variety and quality of fruits raised, and this industry is now of large commercial importance. Another indication of Arkansas' advancement is the fact that values of agricultural lands have increased 123 per cent. in the last five years.

In comparison with other States, Arkansas is a leading one in timber production, ranking fifth, with an annual cut of more than 1,750,000,000 feet. There is still an abundance of standing timber for the future development of this industry, as this State has an area of 22,400,000 acres of different woods of value, estimated to contain thirty to fifty billion feet.

The minerals of Arkansas cover a wide range, including coal, lignite, bauxite, asphalt, zinc, lead, clays, marble, phosphate rock, fuller's earth, soapstone and building stones. Natural gas, too, has been found within the confines of the State, and a number of valuable wells are producing steadily.

These many raw materials for manufacture supplied by the variety of the State's mineral and timber resources, together with its coal, lignite, natural gas and hydro-electric power available through its many rivers, combine to present opportunities for manufacture that are most inviting. And when it is considered that the value of manufactured products of Arkansas advanced from \$45,198,000 in 1900 to \$92,000,000 in 1912, or more than double, there can be no question as to general all-around advantages this State possesses for manufacture.

These are some of the reasons to which can be attributed the rapid growth of the State in recent times. For years, during the time that the Indian Territory was closed to settlement, Arkansas developed slowly. When that Territory and Oklahoma became a State, the gates of Arkansas admitted the people of the world who flocked across her border. In passing, these people beheld for themselves Arkansas' vast storehouse of riches. Many having been impressed with these remembered them, and came to settle here, and also induced others to follow them.

Many forces are now working to bring Arkansas' advantages to the attention of prospective investors, manufacturers and new settlers. There is a co-operation in this work between real estate and colonization companies, the railroads and the State officials, and the splendid results being achieved are reflected by the notable advance which Arkansas is making in every line of activity.

A leader in the development of Arkansas is an Arkansas woman, the president of one of the leading real estate and colonizing companies of the Southwest, a woman of rare business talents, and who has made a tremendous success without in the least losing the attraction of the eternal feminine. The daughter of a minister, a teacher, a model of womanly propriety—a success in business life as she is in the private circles. A few years ago holding a most important clerkship in the Arkansas Legislature, so well was her work performed that when Oklahoma's first legislative session was held they sought and secured her services, and she won the gratitude of the business people of that State to the same degree that she held it in Arkansas.

This woman is the president of the Arkansas Colonizing Co. of Little Rock, Ark., with offices in the new building of the Bank of Commerce. She is thoroughly familiar with the largest affairs in the State, and has successfully negotiated many of the largest real estate timber deals and colonization plans ever handled in Arkansas. She has the confidence of the railroads, the leading financial institutions and the business public in a general, broad way. Her

integrity and business acumen have won for her a complete and deserved success, and largely through her efforts the Arkansas Colonizing Co. has attained the high rank it holds as a leading land and colonizing company in Arkansas and the Southwest.

As evidence of her diversified activities, she has completed arrangements for building a standard-gauge railroad of considerable length to develop properties that she saw had been lying dormant many years, but which needed transportation facilities in order to bring them to the front. The difficulties presented by such an undertaking were of a nature to call for the best in men experienced in such work, but she overcame all obstacles.

The Arkansas Colonizing Co. has large properties of its own, one of these being a few miles north of Camden, Ark., on the St. Louis & Iron Mountain Railway. The battle of Poison Springs was fought on this track. From a white oak tree cut down on this property recently there was taken a bucket of lead from bullets shot into the tree while that battle raged.

This company has the confidence of the owners of cut-over timber lands in Arkansas, and from a number holds the exclusive contracts for the sale of their properties. These lands are being sold to men of large means, large insurance companies, to British syndicates and other investors in Southern properties.

Arkansas lands are now sought after more than ever before in the State's history. The Arkansas Colonizing Co. is well prepared by virtue of its wide range of experience and intimate relations with Arkansas people and conditions to give sound advice concerning lands in the State and to direct investors to opportunities to secure properties that are desirable or suitable for special developments of various kinds.

The company has a large clientele of financiers and investors. Its business has been built up by reliability and a reputation for absolute honesty in all things, large and small. It handles big deals; it does things in a big way. The president of this company has been known to spend as many as eleven months in the woods of Arkansas getting her knowledge and information at first hand. The other members of the company are thoroughly acquainted with every nook and corner in the State.

On one of the company's properties, in what is known as the Ouachita or Camden field, is a tract of 2400 acres containing a large deposit of lignite. Dr. George W. Kimball, a metallurgist of Chicago, now located at Camden, Ark., after nine years of experimental work pronounced this lignite to be of the finest grade. It is said to be different from any other lignite ever discovered, and from it Dr. Kimball has obtained 127 different by-products. When this lignite comes from the ground it resembles ordinary soft coal, except that it is more oily and slightly softer. It is suitable for domestic uses, but far too valuable for such purposes. A quantity of this lignite is placed in a retort. At about 180 degrees Fahr. a colorless water begins to flow from the coal. It averages 100 gallons per ton of lignite. At about 250 to 300 degrees a dense yellow vapor arises. Part of this vapor is condensed into oil, yielding 20 gallons from a ton of coal; the remainder forms a colorless and odorless gas. When the refining process is completed about 900 pounds of pure carbon is left in the retort. Of the 127 by-products obtained, not one is wasted or lost. The water contains some tanning matter that greatly facilitates the tanning of hides. The gas obtained burns with a bright flame and is of a better illuminating brilliancy than gas made from any other coal. The oil is used in the manufacture of many medicinal products, and in making paints, and a most excellent soap is made from the residue. The residual carbon is used for making a waterproof structural iron paint, and for three years has been used by the elevated street railways of Chicago, and is pronounced by them to be a perfect structural iron paint. The oil is used often and successfully in the treatment of hay fever and asthma. The oil has been analyzed and found to contain about 1 per cent. creosote and ammonia. The remaining 99 per cent. is not composed of any material now known to chemists, and has been named "Ark-Oil," in honor of the State where it was first found. The manufacturing concerns that buy this oil work it into more than 100 different medicinal preparations. It is also used as a disinfectant.

The most valuable of all uses to which this oil is put, perhaps, is as a preservative of wood. It rapidly permeates all woods and prevents decay for many years after treatment. In the manufacture of the various products there is absolutely no waste; every pound of lignite put into the retort is accounted for by some finished product.

The gas can be made in quantities at a cost of only six cents per 1000 cubic feet, and no very intricate appliances are needed for manufacturing this gas. There is so much of this coal in Ouachita county alone that gas enough to supply the whole State of Arkansas could be made for a hundred years without appreciably diminishing the supply. A fire clay bed of excellent quality lies eight feet thick above and fifteen feet thick below the coal deposit, running approximately 20,000 tons to the acre. Its excellent quality is put beyond doubt by a most exhaustive chemical analysis and by furnace tests, made by experienced clay manufacturers.

Capital interested in developing these and similar properties in Arkansas, whether it be capital in Europe, Canada or the United States, is invited to correspond with the Arkansas Colonizing Co., Little Rock, Ark.

# Dunbar, West Virginia, Model Site For Various Industrial Enterprises

## New Town in Kanawha Valley That Presents Inviting Opportunities for Manufacturing Plants



DESIGNED, planned and plotted for a model manufacturing town, Dunbar, lying on the Great Kanawha River, six miles downstream from Charleston, W. Va., presents attractions as unique and inviting as can be encountered elsewhere in the country. Possibly its story is told better in the words of Col. Fred Paul Grosscup, originator and manager of the company owning it, than in any other way.

"The foundation of Dunbar," said Colonel Grosscup, "was the physical expression of a desire that has obsessed me for a good many years—that of building a manufacturing suburb that would offer to factory owner and artisan conditions of operation and employment combining the best opportunities for profitable business with the best possible living conditions. In building a town of the highest class from the workingman's viewpoint, there are five essentials—a good rich garden spot for the home, pure water, steady and lucrative employment, proper amusements and cheap transportation to and from city shops and markets.

These essentials are all provided at Dunbar. In securing the site I chose one that had been a market garden, and the soil of which, naturally fertile, had been greatly enriched by the application of natural fertilizers for a number of years. Then I had the lots laid off of sufficient size to give each householder enough ground for a garden in which he can raise all the vegetables his family can consume.

"An abundance of pure freestone water is secured by sinking wells, and this will be pumped into a reservoir located sufficiently high above the town to give the necessary gravity pressure for fire as well as domestic purposes.

"There are already established at Dunbar a number of industrial plants to furnish employment to many people, and other plants will be located as rapidly as possible.

"We are building an amusement park, which will have many attractions during the summer months. We have an artificial lake for boating, and a good race track upon which a matinee driving association gives interesting races during the season.

"The traction line already built to the lower end of Charleston is being rapidly constructed to the center of the city, and will soon be running its cars through the streets. When this line is finished Dunbar will be but 25 minutes from the Charleston postoffice. The fare will be five cents, and the citizen of Dunbar can have the advantages of Charleston's churches, shops and theaters on equal terms, so far as cost is concerned, with the Charleston citizen who lives half a dozen blocks from the business center of the city.

"We believe these advantages will bring to Dunbar laborers of the very best class, a most attractive possession for any community that wishes to secure manufacturing enterprises.

"For the manufacturer Dunbar has many inviting features. First among these, perhaps, stands the abundant supply of high-grade fuel at low cost. The Dunbar Land Co., which owns the Dunbar townsite, has a subsidiary company known as the Charleston-Dunbar Natural Gas Co., a corporation organized for the purpose of bringing natural gas into Dunbar and selling it there at a price that will prove attractive to manufacturers. This gas company now has three lines into the town, from as many different gas fields, each independent of the others, and with an aggregate supply that promises to last for many years. The gas company, being controlled by the same people who make up the land company, and whose chief interest lies in building up their industrial town, guarantees the low price of this most desirable fuel, and the man who establishes his manufacturing plant at Dunbar is thus saved from the danger of greatly advanced prices. Those who find other fuel preferable to gas can be accommodated at Dunbar, for the best steam and coking coals of the country are within easy reach by rail and water, and can be laid down at Dunbar at the lowest possible cost for freight. The fuel factor of the manufacturing equation is solved at Dunbar for all time.

"In the matter of transportation Dunbar is well provided for. It is situated on the Great Kanawha River, a stream that has been locked and dammed by the Government, making it navigable for boats of considerable size throughout the entire year. With the creation of a nine-foot stage in the Ohio, from Pittsburgh to Cairo, an undertaking upon which the Government is now engaged, and which will be pushed to completion as rapidly as possible, there will be perpetual water transportation from Dunbar to the mouth of the Mississippi, and thence to all the world's ports.

"In addition to transportation by water, Dunbar has the advantages coming from three railway lines. The Kanawha & Michigan Railroad runs through the town, and the Chesapeake & Ohio and Coal & Coke connect with it at Charleston. By arrangement with these roads Dunbar takes the Charleston rate on all, without switching charges, and a car loaded at the factory platform in Dunbar goes to any point on either line, or to any connection of either line, at the same price it would pay had it been loaded into a car lying on a siding of either line in the city of Charleston. The Kanawha & Michigan runs into Ohio and there connects with the Toledo & Ohio Central and many other roads leading into the various centers of business in the West. The Chesapeake & Ohio carries to ocean terminals on Hampton Roads, and to

Cincinnati, Louisville and over connecting lines into all the cities of the middle and farther West. The Coal & Coke runs northeast and connects with the Baltimore & Ohio and the Western Maryland, and through them with a network of roads to the East.

"For local passenger transportation the Charleston-Dunbar Traction Co., also a subsidiary of the land company, has built an electric line to the city limits of Charleston, and is now engaged in building it through the streets to the center of the business district. This is a road of first-class construction, laid with 70-pound steel rail, and equipped with cars of the best type. In fact, it is, in construction and equipment, an electric line of the highest class. Built to help serve the ends for which the town of Dunbar was founded, that of making a model manufacturing suburb, the fare on this road between Dunbar and Charleston will be kept at five cents. This will give the Dunbar manufacturer the benefit of the Charleston labor market, for with a five-cent fare and a 25-minute service workmen having their homes in that city can cheaply and conveniently go to their work in Dunbar, just as those who make their homes in Dunbar can find their employment in Charleston if they so desire.

"For raw materials the Dunbar manufacturer has many sources from which to draw. All about are glass sands, some of them of the highest quality known to the country, and these latter especially within easy reach by direct rail route. The first glass made in the Great Kanawha Valley was produced less than half a dozen years ago, and now there are glass plants in a number of different places, including Dunbar, and the outlook is bright for many more within a very short time. In fact, there are well-posted people who express the belief that the Great Kanawha Valley will become, within a few years, the greatest glass-making section of the entire country.

"The fame of West Virginia's hardwoods is co-extensive with the country's boundaries. The poplar, the oak, the maple, the chestnut and various others are of the very highest quality and are much sought after by woodworkers everywhere. Dunbar lies well within the zone of the timber production, and with its numerous advantages of physical position is the logical location for furniture factories and woodworking plants of many other kinds. Millions of feet of timber can be brought to its saws by water, while other millions can come cheaply by rail from nearby forests, and there is no spot anywhere upon which it can be more economically made into its various finished products, or more easily or economically distributed throughout the country's largest centers of population and commerce.

"Iron and steel can come to Dunbar from the Pittsburgh district direct by water, and therefore the location is an excellent one for the manufacture of steel and metal products of various kinds. Shales and clays of high quality lie about on every hand, and the opportunities are good for making brick, tile and other things of like nature. In fact, there is hardly any article in the manufacture of which fuel plays an important part which cannot be economically produced at Dunbar.

"In laying off this industrial town the company carefully preserved the sites that were thought to serve best as the locations for manufacturing plants, and these will be found, I think, especially eligible, in respect of convenience to wharves and railroad sidings. The residence lots are of sufficient area to provide a good-sized garden with each home, the water is abundant and of the best quality, the streets are wide and straight and well-graded. A good many houses have already been built, and the company will begin the construction of 100 more at an early date. These houses will be well built and will contain all the conveniences of modern city homes. They will not be expensive, but they will be comfortable. Just the kind, in short, that should appeal to the artisan and wage-worker of the better class, and for such they are intended.

"There are now in operation at Dunbar a number of manufacturing plants, more will be located there with the opening up of spring, and I believe another year will see a very considerable increase in its industrial concerns. We will be glad to hear from anybody with reference to the location of such plants, and will do all we can to encourage the location of such as are well-founded and worthy, for we believe if they can be operated at a profit anywhere they will be successful at Dunbar."

Such is the story of this new industrial suburb as simply told by the man who planned and founded it, and whose chief ambition is to see it become the model of its kind. Colonel Grosscup and those who are with him in this enterprise have aided in many ways in the growth and progress of Charleston and the valley of the Great Kanawha, and have been the active and aggressive force in some of the leading developments of the city and section, but in no other have they embarked upon an enterprise that promised so much along lines of substantial industrial development as in their Dunbar undertaking. Backed by ample capital and directed by the highest intelligence, the Dunbar Land Co. and its two subsidiaries, the gas and traction companies, should, and doubtless will, make of Dunbar what Colonel Grosscup and his associates have intended it should be—the model industrial town in one of the greatest industrial States in the South.



## Typical Crops on Louisiana Reclaimed Lands



CORN IN JULY ON RECLAMATION LAND, NEAR NEW ORLEANS, TYPICAL OF ALMOST LIMITLESS POSSIBILITIES.



GATHERING LATE CROP OF IRISH POTATOES, CORN HAVING BEEN PLANTED BETWEEN POTATO ROWS. PHOTOGRAPH TAKEN IN JULY.

# Reclamation Potentialities of Louisiana

## A National Asset Worth Billions

### THE RICHEST LANDS KNOWN TO MAN NOW BEING UTILIZED—GREAT DRAINAGE AND SETTLEMENT OPERATIONS



**I**N the so-called swamp lands of the South there is a potentially richer asset of this nation than all of the gold and all of the timber the United States has ever contained.

The gold, always an inferior product compared with the one item of cotton production in the South, does not reproduce; a merchantable tree requires from the thirty years of a loblolly pine to the thousand or more of a cypress to attain its growth, while every acre of Southern swamp lands can be made to produce from one to four crops, worth from \$15 to \$500 an acre or more, every year, to the end of time.

The alluvial wet lands of the Louisiana delta, some five million acres in extent, lead all the other so-called swamp lands in richness and fertility and are susceptible of the production of hundreds of millions of dollars' worth of foodstuffs every year.

The country is just now beginning to wake up to the significance and importance this situation contains.

Only seven years ago it was difficult to find any number of people, even in New Orleans, who believed the wet lands of Louisiana were susceptible of successful drainage at all, while outsiders turned deaf ears to the arguments in their behalf. Now only the obstinate refuse to recognize the tremendous possibilities for agriculture in these same lands, while outside capital by the millions is actually employed in the work of drainage and pumping that is transforming thousands of acres every year into farm lands of fertility unsurpassed on the globe.

Twenty-five companies are at work around New Orleans with ownerships of half a million acres; between thirty and fifty dredges—the number being added to all the time—are at work cutting canals and ditches; fifteen thousand acres have been made ready for the plow, and more than 150,000 additional acres are involved in the plans of companies in the field.

The movement is on, and with accelerating speed it is now proceeding to the inevitable goal of the utilization of every acre of this most marvelously rich soil for the cultivation of corn, cane, truck, vegetables, oranges and livestock as well, until South Louisiana shall have become the most densely populated and most prosperous region of the globe.

Exhaustive laboratory tests have revealed the phenomenal richness of the soil. It contains enough nitrogen to raise a thousand crops of corn, 75 bushels to an acre. Every variety of garden truck and vegetables can be raised bountifully and early. California fruit growers are enthusiastic over the possibilities of vastly extending the long established orange and grapefruit industry here, there being no finer specimens grown than the Louisiana sweets in oranges and the varieties of grapefruit raised.

With a soil hundreds and thousands of feet in thickness; with river, rail and ocean transportation at the door, and with additional shipping facilities provided by the deep and wide canals drainage requirements will create; with the close proximity to all the great market centers of the country, thousands of miles nearer than the Pacific coast orchards and farms; with the chief city of the South as the central shipping point; with a climate of statistically demonstrated great healthfulness and conspicuous salubrity, the bugbear of unhealthfulness having been entirely eliminated by science and drainage, the foundation for a vast development exists here as in no other section of this or any other country.

A recognition of this fact by the world at large seems imminent now. South Louisiana at last appears to be coming into its own!

Misunderstandings as to the nature of the alluvial wet lands' character and formation and the methods of their so-called reclamation are being cleared away.

Except in the cases of infrequent crevasses or breaks in the Mississippi River system of levees—and protection under national auspices, until this danger shall have been as certainly eliminated as in the case of vastly more difficultly dyked Holland, will inevitably be provided—there are no overflowed lands in the lower Mississippi delta. The swamp lands here are simply level stretches of silt and humus on which rain water falls, accumulates and saturates, without opportunities for sufficient drainage in the natural state. The levees of the river shut out any original drainage that occurred, for no streams flow into the Mississippi for hundreds of miles above the mouth.

The water in the rivers, bayous and streams must thus find an outlet into the Gulf of Mexico through channels other than the Mississippi.

Drainage operations therefore consist in digging canals, reservoirs and ditches with sufficient depth to draw all the surface water off, when, with adequate pumping plants and levees of proper height and strength thrown around a district to be drained, the water can be lowered to six feet or more below the surface by being pumped into lakes and streams that have their outlets in the Mexican Gulf. Thoroughly drained tracts are thus right now placed in identically the same position as is New Orleans. Before the installation of the present admirably complete drainage system water was found within a few inches of the surface anywhere. Then a pumping process was necessary as a preliminary in the construction of any city building. Now dry earth is found in any excavation to a depth of six or more feet, and cellars and basements are frequent instead of being wholly unknown, as was the case within very recent years.

One retarding feature in the wholesale drainage of Louisiana's wet lands was the lack of statutory provision for drainage bonds to secure funds for

the cost of the work, ranging from \$15 to \$35 an acre, in accordance with the heaviness of the work to be undertaken.

The State Legislature in 1910 passed a law enabling owners to form drainage districts and issue bonds, under the direct supervision and responsibility of the State Board of Engineers, the proceeds to be devoted solely to drainage purposes, and to be paid for when issued by a fund collected as a tax by the State running throughout a long term of years on the lands in the district affected. The proceeds of the bonds when sold are available as needed to pay for drainage work. The tax is in the nature of a first lien on the property, and its levy and collection are made the imperative duty of the drainage board and tax collector. The lands must be sold for taxes if not paid each year, though only one year's taxes are payable at one time, the whole amount covered by the issue not becoming due in case of default as in a mortgage. No court proceedings are necessary, the property being simply advertised for sale for taxes, the cost for which would not exceed from \$5 to \$7 in the case of any single transaction.

In operation it is unconceivable that any difficulty would occur in securing the \$2 an acre or so which would represent the amount of any one year's taxes—for any land included in a drainage district would be worth many times more than the entire taxes of any one year.

The constitutionality and validity of the law have been affirmed by the Supreme Court, and the bonds are declared to be remarkably well safeguarded and secured. Although not generally understood by bond buyers as yet, several issues have been marketed at favorable terms, and it is predicted that within a few years no bonds on the market will find a more ready sale than the Louisiana reclamation bond.

It is recalled that in the early years of the Louisiana levee bond it was not in popular demand, whereas now it sells readily at 118 or so, and the prediction is made that the reclamation bond will have a similar history, to the vast advantage of the bond houses and purchasers who early take hold of these securities.

An interesting and illustrative review of the drainage proposition in Louisiana is furnished by John A. Kruse, an eminent engineer and drainage expert, with offices in Chicago and New Orleans, who is in charge of a number of the most important enterprises in Louisiana. He has had a wide experience in this country and in other countries of the globe, and is thus qualified to give an expert opinion. Mr. Kruse's statement of the case is given herewith:

"The reclamation by drainage of the 75,000,000 acres of so-called swamp land of the United States is the most important question to the people of this country that has been brought to their consideration since the Civil War. Its importance to all the people of this great country and the magnitude and scope of its results are so vast and far-reaching that it dwarfs into comparative insignificance even the work of digging the great Panama Canal. The reclamation of this, the best land on the continent, will bring into bearing an area of land which will have a producing capacity sufficient to support a population almost, if not quite, equal to that of this country today; an area of land with a producing capacity (measured in dollars and cents) which will range from three and one-half to four billion dollars per year; an area of land which will provide homes for millions of people, and food and clothing for still more millions. Of this area of the most fertile land there is a particular portion which may be called the 'Best of the Best.'

"It consists of about five millions of acres of land which, in the language of an eminent engineer of wide experience in the Government reclamation service, 'is unequalled.' There is no other like area known to the white race which will support so dense a population. This great area of the most fertile lands the world has ever known, or probably will ever know, is called the Lower Delta of the Mississippi, the wet and overflowed lands of Southern Louisiana. This statement is borne out by logic of the situation, because his great area is made up of the cream of the top soil of the richest lands of 26 of the richest States of the Union, which soil has been carried down by the mighty Father of Waters, the great Mississippi River, and deposited on the floors of the Gulf of Mexico, forming a soil averaging from 1000 to 3000 feet in depth and comprising the area mentioned.

"Not only are the reclaimed lands the richest and most fertile of any in the locality in which they are situated, in whatever community, county or State, but they have proven to be the richest lands of all the countries of the globe. Two-fifths of the entire kingdom of Holland is drained land, and a great portion of it was recovered from the sea, and this great area became, and is, the most fertile part of the lands of Holland. Owing to the production of these lands, Holland developed two great seaports, Antwerp, the third export city of the world, and Rotterdam, the fifth. The reclaimed lands of Belgium, Denmark and portions of Germany are the most fertile of those countries.

"Reclamation in Holland at the time it was undertaken was a stupendous problem, because they had to fight back that great enemy, the enemy of the floods from the rivers, as well as to resist the invasion of that greater foreign enemy, the sea, which is restrained by the raising of big levees around the land to be reclaimed, of sufficient height and size to hold out a daily tide of 31 feet maximum. The base of these levees is 250 feet wide and they are from 42 to 60 feet high. The cost was very great, but notwithstanding that the work was undertaken by the government, and through it Holland was



made a great kingdom. Thirty-eight per cent. of the cultivated lands of the kingdom are below the level of the sea at high tide.

"England has had its reclamation of its swamp lands and fens. England was beginning to realize that with her increasing population the available area of productive land would not support them, and she turned to her fens or swamp lands for relief as the means to feed her people, and she found that by reclaiming these lands she had brought into productiveness such a rich territory as to enable her to reach out and establish colonies in all parts of the world.

"In the eighth century nearly 6 per cent. of the total present cultivated area of the continent of Europe was known as unreclaimable morasses, and since the same has been reclaimed that land is supporting upwards of 35 per cent. of the population of that continent. Twenty per cent., or one-fifth of the entire present cultivated area of England and Ireland, was marsh or swamp lands in the days of the Saxon kings.

"These reclaimed lands of Europe have a market value today of from \$1000 to \$3000 per acre.

"We see what has been done in the foreign countries. Reclamation was accomplished at an immense cost in those days, because none of the present modern dredging machinery was known, and yet it has paid for itself thousands of times over and has enriched not only the countries in which the lands are located, but also the population of those countries. And today those reclaimed lands are the backbone of many of the great nations of Europe.

"The swamp or wet lands included in the list of reclaimable lands in Government reports, all of it, every acre, in every section, as judged by what has been accomplished in Illinois, Iowa, Missouri, Louisiana and other States in this country, is as rich, if not richer, than any of these European lands. The results have shown that the reclaimed swamp lands are the richest lands in every State and in every country in the world. But the richest and most fertile of all these wet lands, the richest of all the swamp lands in the world, the richest large area of land of any kind that is known to the human race the world over today, is that great tract of alluvial land in the lower delta of the Mississippi River within the borders of the State of Louisiana.

"All swamp lands are formed, as is well known, by the depositing of soil that is washed down from the slopes of the surrounding watersheds into the valleys by the streams of the country. At the same delta of the Mississippi, in Louisiana, there is the most fertile land of the world, because it represents and is built up from the richest soil of the greatest drainage basin on earth; in fact, it is the cream of the top soil of twenty-six of the richest States in the United States, and is therefore the most fertile soil known. These twenty-six States included in the drainage area of the Mississippi River have for centuries been giving up the cream of their top soil to make up the delta of the Mississippi River. Ohio, Kentucky, Indiana, Illinois, as far east as Pennsylvania, Minnesota and the Dakotas on the north, Missouri, Kansas, Iowa and clear into Montana, all have contributed to the results, and all the soil so given has come from the top soil of the best farms that exist there, carried by the rains into the streams, thence into the great river, to make the finest mixture that is possible for a chemist to compose from all the elements of all of the soils of the world carried down and deposited on the floors of the Gulf of Mexico, forming that great region. This work is still going on and will not stop while the great forces of nature continue, and that great robber, the Mississippi River, is still taking away the soil from our farms with every rainfall, carrying it down into the rills, thence into the rivulets and streams on into the mighty Father of Waters, to be by him carried down where it has built up that great area of the most fertile land known to man.

"Experiments have shown a depth, all over the delta, of an average of upwards of 1000 feet, and at one point where a depth of over 3100 feet was reached, this being the deepest boring being made in the section, the drill was still in the soil when the drilling ceased. That soil is not only the cream of all these different farms, but all of the cream of these richest farming States has been amalgamated, mixed together and deposited there, and it has had for centuries a wonderful growth of vegetation which produces the organic matter commonly known as humus. And in such a genial climate—in a place where the hours of sunshine are so many every year, with the many more hours' growing time than in the States from which the soil was taken! This top soil or humus silt, in itself, would be worth a large amount of money transported back to the farms from which it came, if used as commercial fertilizers are used today.

"The same necessity that forced the reclamation of the low lands of Holland and the fens of England is forcing the reclamation of our swamp area. Within the last decade the attention of the capitalist and the farmer has turned to the great alluvial deposit of the lower delta. The wonderful richness of its soil, its healthful climatic conditions, its adaptability to the growing of the greatest variety of crops, its long-growing period, its nearness to market, have all combined to bring this area into public attention. The work of reclaiming the lower delta country is well under way, and is being pushed with great vigor. The reclaimed lands are being eagerly bought by the thrifty farmer from the North, and he finds in their wonderful soil and salubrious climate a veritable mine of wealth.

"When it all is drained, as it can and will be unquestionably within a very few years, it will have the capacity of producing one billion dollars per annum, or more than twice the total gold production of the world, and this production can be maintained, not for one year, not for ten years, but for all time.

"It will have the capacity of producing each year a sum sufficient to pay all the present expenses of running this great Government. These fertile acres in the delta region, when reclaimed, will provide homes for millions of people. On the basis of population of Holland they would take care of and furnish homes for 7,500,000 of population. On the basis of the population of the reclaimed lands of England, including the cities and towns, and with New

Orleans as the great center, they would have the capacity of sustaining a population of upwards of fifteen millions. Based upon the productive capacity of portions of this area already occupied, that is, the lands tilled by the Acadians, the people romantically described by the poet Longfellow in his 'Evangeline,' who are now living along the Bayou La Fourche, Teche and others, they would have a capacity of providing homes for upwards of six millions of people. President Roosevelt, in his annual message to Congress December 4, 1907, said:

"As an incident to creating the deep waterway down the Mississippi, the territory lying adjacent to the Mississippi along its lower course will therefore become one of the most prosperous and populous, as it is already one of the most fertile farming regions in the world."

"The prediction contained in President Roosevelt's statement is based on the fact of the great and enduring fertility of this region, a fertility equal to, if not exceeding, any other equal area in the world.

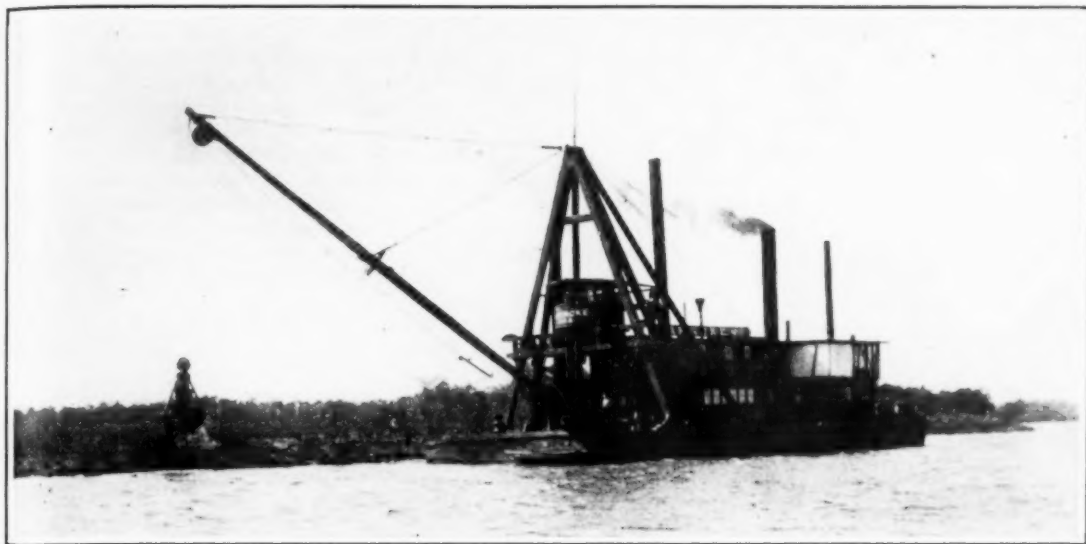
"This great area of the most fertile land of the world has been so fortunately placed by nature that it possesses every advantage that the cultivator of the soil may desire in an equable and healthful climate, where the hours of sunshine per day, month or year are greater than in any of the farming sections from whence the land was taken; with a well-distributed rainfall; at the doors of the great bulk of our population, surrounding one of the great cities of the world, thereby insuring markets for the products at all times, this area, when reclaimed and occupied by an intelligent agricultural class, will not only be one of the most productive, healthful and beautiful districts in the world, but is bound to become the mecca of the tourist, the sanitarium of the invalid and the winter playground of the people of this continent. It is doubly important at this time and in this city, because it means that the predictions made by Thomas Jefferson, at the time of the Louisiana Purchase, are about to be fulfilled, because it means that New Orleans is going to become, as he said, one of the great world cities. It is important because this city, now one of the great seaports of the world, is to become a densely populated city with a surrounding prosperous agricultural population of from five to fifteen millions of people within a radius of 100 miles. It is important at this time because the great vast area of free and cheap lands which the Government heretofore possessed has been exhausted; because with no further virgin soil to be placed in cultivation except these unreclaimed areas, our population is increasing at such an accelerated rate that fear is expressed in economic circles that we may become importers of foodstuffs instead of a nation made great by the exportation of these products, and it has been stated that our population will be doubled by the year 1940. We have read the statement made by the President of these United States in his speeches, that the lands susceptible to cultivation were exhausted, and that we must look to better and more intensified cultivation of the present areas if we wish to avoid becoming a food-importing nation.

"The statistics show that in the last decade the area in cultivated land increased but 4½ per cent., while the population increased nearly 22 per cent. at the same time. When it is taken into consideration, further, that this Government is now spending \$15,000,000 a year in teaching methods of more intensified farming that we may increase the production per acre to such a point as will take care of our increasing population, it being impossible to further increase the area of land capable of cultivation, these considerations make the subject of drainage reclamation one of the utmost importance to the people of this city and State; in fact, to all of the people of this great nation.

"As related to the reclamation of these lower delta lands the engineering problems seem simple, and it is indeed simple as compared with many of the engineering problems which have been solved by engineers throughout the world. Simple and cheap as compared with the reclamation of the lands of Holland, Belgium, Germany or England. But its very simplicity may be a source of great danger for the reason that, simple as it looks, and is, it presents many problems which must be solved. Each reclamation project presents difficulties and problems of its own, and while the entire question of drainage is founded on great underlying principles, the conditions are so different and vary so much as between the different and various sections of the country, as well as the different projects in the same sections, that each one requires the careful consideration of the drainage engineer.

"Even with all the data that can be collected there is still the liability of error in drainage engineering on account of the lack of constants and the different conditions in different districts. Mistakes have heretofore been made in this respect by eminent engineers, one of the most notable instances being that of the drainage of the fens of England. When the work was really begun by King Charles I there was great opposition to it, and the most noted engineer of Holland, Cornelius Vermuyden, was employed to make the plans and take charge of the work. The plans were made by him and were based upon conditions with which he had dealt all his life in the reclamation work in Holland, and they were not at all suited to the conditions existing in England. As a consequence the estimates of costs were found to be too low, and the Government of England had to come to the rescue of the project of guaranteeing the bonds three different times after the necessary changes and alterations of the plans of this great engineer had been made.

"There are none of these difficult problems to be encountered in the reclamation of these most fertile Louisiana lands; in fact, it is not reclamation, as the mean level of the land is above the high tide level of the Gulf. It is therefore simply a drainage proposition. The land being so nearly level, and having such a luxuriant growth of vegetation, the heavy rainfall cannot run off without artificial channels to carry it away; therefore, the accepted or standard plan is to enclose the unit or tract to be reclaimed within a levee or dyke, to prevent an overflow from the occasional severe storms of the Gulf or a crevasse in the levee of the Mississippi. The building of the levee gives the land the advantage or benefit of a navigable canal all around the enclosed unit, which canal connects with all the great waterways of the State. The drainage is accomplished by a system of reservoir canals, laterals and



DIPPER DREDGE DIGGING DRAINAGE CANAL.

field ditches, all connected together to a main reservoir canal on which is placed a pumping plant to remove the excess rainfall from within the levees to the outside or navigable waters connecting with the Gulf. Both reservoir system and pumping plant should be designed of sufficient capacity to take care of the runoff from the heaviest rainfall before injury can result to crops growing on such land.

"So far the work that has been accomplished has been done largely by private capital and private enterprises. The Louisiana Legislature at its last session passed a most excellent drainage law providing for the organization of drainage districts and the issuing of long-time bonds to provide funds to carry out the work. This will, in the future, be a great aid in developing this country. A bill is before Congress at the present time providing for Federal aid. The drainage of four million acres of uninhabited swamp area is a herculean task, and because of its great importance, if there is a way that the Government can render aid in this work, it should be done. If it could spend hundreds of millions in the reclamation of a desert, why should it not aid in draining and making fit for habitation this, the richest body of agricultural land in the world? This area has a greater supporting capacity than any other equal area occupied by the white race. The popula-

States, and it will thus be seen that with the excellent transportation facilities that exist the market conditions will always be the best. And,



A FINISHED CANAL CUT PREPARATORY TO DRAINING LANDS OF THE DELTA LANDS CO., PARADIS.



THIRD STAGE IN THE PROGRESS OF RECLAMATION WORK.

Town building where water meets the rail at Paradis. Navigable canal gives water transportation to New Orleans, while main line of Southern Pacific is on the left.

tion of the Acadian settlement occupying the front lands of Bayou La Fourche is 362 to the square mile for the cultivated area and is rapidly increasing. Along this bayou is a street 65 miles in length, with an average distance between the homes of less than 200 feet. This reclaimed land will support a greater population than the low lands of Holland or the fens of England. The reclamation of many thousands of acres has already been completed. As in Holland and in the fens of England, the reclaimed tracts are traversed everywhere by canals. The farmers occupying these lands control their own transportation; the transportation does not control them. There is already within the State of Louisiana nearly 5000 miles of navigable waters, and the reclamation of the lower delta will add to this at least 2500 miles more.

"As the crow flies the city of New Orleans is located but 500 miles from the center of population of the United

States, with a population of 350,000 inhabitants, is already the second port of entry in the United States, and its important export trade is increasing with notable rapidity. The opening of the Panama Canal is not only going to add materially to this foreign trade, but is going to exert a wonderful influence on the development of the city and the surrounding country.

"In 1804 President Thomas Jefferson said that New Orleans was destined to become one of the largest cities of the world. It surely occupies the geographical position to become a great and prosperous city. The development of the contiguous swamp area will add immensely to its development and prosperity. There are in the lower delta upwards of 5500 square miles of reclaimable lands, lands that will within a reasonable time be reclaimed. On the basis of the present population in the La Fourche country, this area will have a population of more than 2,000,000 prosperous, thrifty people, and on the basis of the population of Holland it will be upwards of 5,000,000, and the product of these lands annually will be of greater value than the total output of gold in California since its discovery at Sutter's Mill in '49."

As indicating the plans and scope of operation of some of the companies



engaged in drainage work, a somewhat detailed description is herewith given of typical enterprises under way in Southern Louisiana.

#### EDWARD WISNER AND LOUISIANA MEADOWS CO.

Edward Wisner, universally acclaimed as the Father of Drainage in Louisiana, with an ownership of wet lands running into millions in value, has had the usual experience of the pioneer in any field, in that for years he stood alone the almost solitary champion of a cause in which he believed. A banker in Michigan, he came south for his health, which he found. From Northern Louisiana he removed to New Orleans, and with the then firm of Wisner & Dresser began the purchase of so-called swamp lands in 1900. Of such little value were any of these lands then regarded that he was able to



BUILDING SHELL ROADS.

The shells are barged in from the sea and make roads that are second to none in the United States.

secure thousands of acres from levee boards, in whom title had been vested by the United States Government in the fifties at 12½ cents an acre. Nobody wanted the lands at any price at that time, and sales were considered well made by the State at 12½ cents an acre. After subsequent purchases at 25 cents, the members of the board began to feel that Wisner ought to be restrained by a legal guardian from squandering his means.

Still keeping up his purchases, the authorities became finally convinced that he must have some definite purpose in mind and concluded that the State would do well to refuse further dealings with him, and they declined to ratify any more sales in which his name appeared as intending purchaser. In the aggregate, his holdings amounted at the maximum period to 1,300,000 acres.

Wisner from the first foresaw the possibilities of drainage, but it was not till 1906 that steps were first taken for artificial drainage through canals, reservoirs, ditches and pumping plants.

Lands along the ridges, requiring only gravity drainage, were sold from time to time, and the proceeds used to ditch, levee and drain the first unit of 1000 acres on the Raceland prairies.

A second unit of 1000 acres was likewise drained and settlers were induced to locate.

At that time there was no precedent for guidance. There had been some reclamation of swamp lands, but only of wet lands adjacent to "front land" ownership. Nobody had gone onto the "trembling prairies" to drain and prepare them for the plow, and skepticism was rampant. There were no engineers who felt qualified to point the way—none who knew more of the problem than did Wisner himself.

Prospective purchasers asked who had lived on these reclaimed swamp lands, and finding that it was an untried experiment, it was possible to secure only those who had nowhere else to go—many of those making the experiment doing so only on the basis of pay for locating and working on the lands.

It was subsequently found that the levees, canals, ditches, reservoirs and pumping plants, which were modeled after those in use by the natives for semi-drained lands, were inadequate for complete drainage, and when a third unit was created advantage was taken of the experience had, and deeper ditches, more capacious canals and reservoirs and more adequate and modern pumping plants were installed. By these means complete drainage was secured and there are farms in this district where the water table has been reduced to six feet below the surface of the ground, as in the city of New Orleans.

Among the venturesome ones who went where no human being had ever lived before, there were some who remained and made good; others went away.

The earlier developments will now be gone over, and with a more adequate drainage system conditions will invite the stable permanent settlers like those who have located and stayed on the later developed tracts.

Today at Raceland there are about sixty white families, mostly from the North, who own their own land, a good part of whom have fully paid for their lands, and all of them as permanently located as are farmers anywhere. Some have made big returns on their crops, and based on calculations in vogue in Illinois and other Northern States, of reaching valuations of lands through the value of crops produced, these lands have an intrinsic worth of \$250 to \$500 an acre today.

The Wisner interests now have about 4500 acres completely drained and under cultivation in the Raceland district, with 15,000 additional in the same locality on which work is being done with the expectation that it will all be ready for cultivation within the next two years.

About the time the third district work was inaugurated an experiment

was made near Lockport of reclaiming a tract of 750 acres from the bottom of a lake—Lake Fields. Together with an old friend, A. V. Smith, also from Michigan, a partnership was formed by Wisner for the development of this property. Smith invested all he had left from a disastrous business experience, \$1800, and Wisner agreed to advance whatever was necessary to complete the work beyond this sum. From first to last \$18,000 was advanced by him. The work began in 1908, was eminently successful from the start, the land becoming friable and ready for the plow almost immediately after the leveeing and drainage, and a sugar plantation was established, the place now being known as "Smithport." Houses, tenements and buildings have been constructed, the place brought to a high state of cultivation and efficiency, and last year a net return of \$20,000 was secured from the crops and stock raised on this 750-acre farm. Smith had had no previous farming experience, being simply a practical man of affairs.

In 1907 the firm of Wisner & Dresser was dissolved, and Wisner took over the ownership of the wet lands the firm had acquired.

Needing an organization to handle projects, A. B. Graves, then in a bank in Michigan, was induced to handle the finances of the concern, and later Allen T. Dusenbury, also of Michigan, an engineer and land title man, was secured to look after outside physical affairs.

The Louisiana Meadows Co. was subsequently formed with Wisner as president, Dusenbury as vice-president and Graves as secretary and treasurer. This company took over all the Wisner holdings. After the manner of Carnegie, the young men were given an incentive to the greatest possible activity by having an interest in the business settled on them. The work they have done has resulted in the greatest possible enhancement in the values of the company's holdings, so that their prospects for also getting into the millionaire class are excellent, and today the company owns lands in the parishes of St. Charles, Lafourche, Terrebonne, Plaquemine, St. Bernard, Jefferson and St. John Baptiste.

In addition to the drained acreages at Raceland and Lockport, the company has 5000 acres on Bayou Barataria, which has all been ditched and prepared for drainage and on which a pumping plant is being installed.

Wisner, Graves and Dusenbury also own a 4000-acre tract on Bayou Des Allemands, which is largely drained and which they will cultivate themselves.

Also a dozen or so of the most important companies operating today in the vicinity of New Orleans, on drainage projects, are working on lands originally included in the Wisner holdings, while the present Wisner ownerships are still the dominating factor in the wet lands situation here.

#### THE WHITE LAKE LAND CO.

One of the best demonstrations of the practicability and value of the so-called reclamation of the marsh lands of Southern Louisiana is found about one hundred and seventy miles west of New Orleans, in Vermilion parish. This is the property of the White Lake Land Co., a Michigan corporation, of which Mr. A. L. Arpin is president, deriving its name from the fact that the 80,000 acres comprising the holdings of the company lie immediately north of the body of water designated on the maps as White Lake.

These eighty thousand acres offer an ideal opportunity for the reclamationist, in that they are a broad, level stretch of almost treeless prairie—so



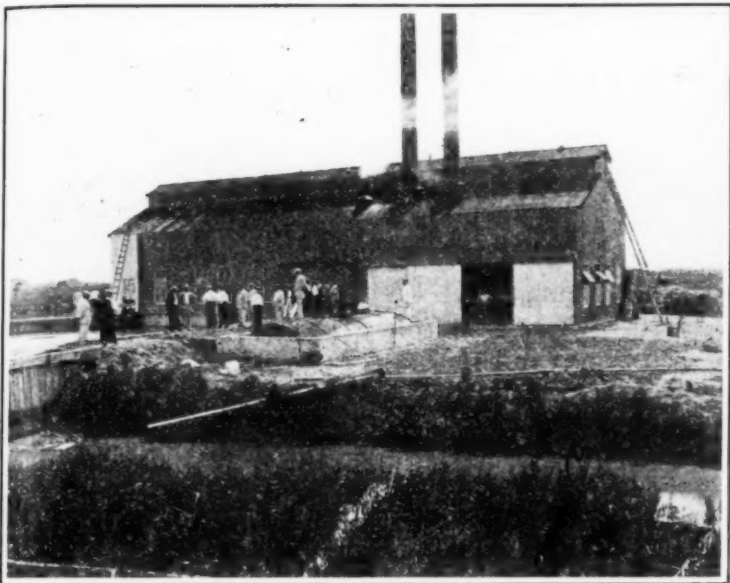
A WELL-BUILT SHELL ROAD IN ST. BERNARD PARISH (COUNTY).

level that the heavy annual rainfall of this vicinity cannot readily make its way to natural outlets; and, because of this, water in varying depth stands for the greater part of the year. Because it is level, on the other hand, and free from stumps, stone, rock or other hindering substance, the work of the big dredge boats is simplified and cheapened as compared with those regions in which such obstructions are encountered. Again, the tract forming an almost perfect parallelogram some twelve miles in width by fourteen miles in length, offers the engineer no problem beyond simple geometric lines; it may be and is, so far as the survey has progressed, laid off with the simplicity of a checker-board.

The White Lake Land Co. began its operations upon this tract something like two years ago, at which time its first unit of 5700 acres was platted, following the organization of a drainage district under the laws of the State by which bonds were issued and a tax levied to provide funds for their repayment. This first unit consists of an almost perfect square, around which has been thrown a levee, thus fortifying the unit against the encroachment of water from without. Inside the levee there was then, by the use of heavy machinery designed for the purpose, established a system of canals and

ditches by which the water is accumulated in the larger of the canals; whence, by the use of centrifugal pumps, it is lifted from the interior to the exterior of the surrounding levees, there to disappear by evaporation or by slow dissipation into water courses leading to White Lake.

Nothing could be simpler than this method of drainage, from an engineering standpoint, and it would seem that even the layman at his first observation would be convinced of its soundness in theory and practice—as, indeed, he usually is. But it is an expensive proposition. It is quite easy to say that a levee has been built, that canals and ditches have been dug, and that pumps have been installed, but the expenditure of time, labor and money upon the undertaking is a thing of no mean proportions. In the first place, the levee surrounds approximately nine sections of 640 acres each, or 5760 acres, in a



STEEL AND CONCRETE PUMPING PLANT ON PROPERTY OF WHITE LAKE LAND CO.

square having four sides each three miles in length—twelve miles or so in all. The levee has an average base of perhaps thirty feet and an average height of between four and five feet. Then there are between twenty-five and thirty miles of canals, ranging in width from twenty-five to fifty feet and in depth from six to ten feet. Again, connecting these canals, is a network of lateral ditches many miles in length. All this means work, and lots of it, and money, and lots of it, and time, and lots of it. In addition to this part of the design came the pumping facilities. Located in the southeast corner of the square as described is the pumping plant. It is said to be the largest plant of this character devoted to drainage in the South. It has a capacity of 220,000 gallons per minute. That is its maximum. It will seldom or never be fully used. In truth, it is only under extraordinary circumstances that the pump will be called upon at all. Under normal conditions the system of ditches and canals takes care of the drainage of this unit of land without the assistance of the pumps to remove the water from within the barricade. Evaporation and absorption and the natural flow ordinarily take care of the water that before the installation of the system was surplus. But there are times when the rainfall in this section reaches as much as eight inches during twenty-four hours. And it is at these times that the pump is necessary. It is an emergency provision. By it, too, in the possible event that rainfall is deficient, the unit, or polder (by which name the square of drained land would be known were it located in Holland, the home of "reclamation," so to speak) could be adequately supplied with moisture—irrigated in the most modern and approved way.

During March of 1912 the system of drainage as here outlined was completed, and the test of its practical operation was made. It had been a general opinion—it must be understood that drainage of large bodies of Southern Louisiana land was still largely a matter of theory rather than practical exemplification—that within thirty days of the starting of the big pumps on this unit the big traction plows and pulverizers of soil could be started and that a first crop of corn could be planted that season. But not many days elapsed before it was well understood that a longer time would be required to remove the moisture from about the grassroots, which served as a sort of sponge, than had been reckoned. Consequently, only a small portion of the land was put to crop during 1912.

In the meantime a demand for the land had been created among the Northern homeseekers, hundreds of whom had accepted the invitation to come upon the ground and make personal inspection and investigation of the proposition. From Indiana, Iowa, Illinois, Missouri, Minnesota, Nebraska—especially Nebraska—came the visitors. A very large proportion of them, immediately impressed with the prodigality of nature in the way of fertile soil, delightful climate and unlimited opportunity, became purchasers of parcels of land, and it was not long before every acre of this first unit of 5700 acres had passed into the ownership of these energetic and ambitious Northerners, the majority of whom contemplated immediate settlement upon the land and its improvement. There has been some unlooked for delay in this respect, as intimated, but today, where less than twenty months ago was a barren, unsightly, unproductive marsh—repellant from every aspect—there has sprung up an active village (Florence), surrounded by new farms upon which nearly one hundred families are working out their destinies.

Even before the first unit of 5700 acres was "reclaimed," the White Lake

Land Co. began operations upon a second unit of 2600 acres adjoining. The same engineering problems were met with, and the same work along the same general lines was put upon this unit, the result being that during the fall of 1912 it, too, was ready for the occupancy of the buyers from the North who had already become its owners. And a third unit of 5000 acres commanded the attention of these energetic reclamationists. This, too, has made considerable progress, and will shortly have passed through the various stages from wet lands to cultivated farms as have the tracts referred to.

This, then, is the present status of the business of the White Lake Land Co. in Vermilion parish: 5700 acres have been drained and are now being cultivated, upon a portion of which crops were grown for the first time in history during 1912 and upon all of which crops will be growing this season; 2600 acres are almost ready for the plow, and the larger portion, if not all of it, will be in cultivation during 1913; 5000 additional acres will have been drained and made ready for the plow by the beginning of the season of 1914. Of this, the greater acreage has already been sold. Indeed, the demand for the land is so far in excess of the supply that eighteen months or two years will be required for the reclamation end of the business to catch up with the selling end.

Finally, the demonstration here may be said to include the practicability, the feasibility of drainage as planned; the possibility of its profitable cultivation (there never has been a question of the fertility of the soil); the possibility of its disposal to Northern farmers and its perfect adaptability to their uses.

The White Lake project is the largest private enterprise of its kind in the South. Its inauguration at a time when the public was more than skeptical upon the subject of drainage as applied to the marshes of Southern Louisiana demanded from its inspirators more than ordinary business nerve and daring, but by adhering closely to its original plans as made by able and successful engineers, while readily adapting itself to emergencies and unlooked-for contingencies as they arose, and the readiness and ability to meet the heavy expenditures of money involved, the project has become of nation-wide fame and is one of the show-places of the State to which the home-seeker from the North quite naturally gravitates when seeking information concerning the wonderful resources of this part of the South, and confirmation therein. Best of all, it stands up handsomely under any test that may be applied, and it is certain that in the time to come, when all the submerged area of the State shall have been drained and made mightily fruitful, the White Lake Land Co. will occupy that enviable position universally and deservedly given the pioneers and leaders at the head of any movement inherently great in the benefits it may confer upon the human family.

#### LOUISIANA DELTA LANDS CO.

A very notable development is that of the Louisiana Delta Lands Co., owner of the Paradis tract. The lands of this company, some 19,000 acres in extent, are in St. Charles parish, beginning about 27 miles from New Orleans and fronting on the main line of the Southern Pacific Railroad. The officers of the company are: J. Lahroy Slusher, president; Julius F. Funk, vice-president and treasurer; Henry L. Favrot, secretary.



INSIDE VIEW OF PUMPING PLANT OF WHITE LAKE LAND CO., SHOWING CENTRIFUGAL TYPE OF PUMP IN GENERAL USE FOR DRAINAGE PLANTS.

Vim and vigor have marked the operations of this company from the beginning. President Slusher is a thorough land man; Mr. Funk is one of the Bloomington, Ill., Funks, who are among the most famous and successful corn growers in the world, and Mr. Favrot is a New Orleans attorney who has specialized on drainage matters, and was, as a member of the State Senate, instrumental in getting through the drainage bond law of 1910, the joint product of himself and Mr. R. E. Milling. Behind that company is ample means, and, with officers in New Orleans and Chicago, a selling force is kept at work that is producing remarkable results. Up to date over 6000 acres of the tract have been sold to Northern farmers in 40, 60 and 80-acre tracts. Twenty-five families were located on the property by Christmas, and 100 families are expected to be located by the first of May. Excursions of prospectors are brought down at



frequent intervals from the North, and an unusually high percentage of them become investors.

At the town of Paradis there has been built a commodious and comfortable hotel, a bank established and other improvements made. Mr. Funk has built him a home, and he and his family remain there a large part of the year. Mr. Slusher spends most of his time down there, so that all prospective purchasers are given the most complete personal attention and consideration.

With its many new homes and cultivated tracts, in full view from trains on the Southern Pacific, the development of Paradis makes a most favorable impression on the casual passerby as well as on those who stop for an inspection of the place. Highly remunerative truck farming is engaged in, and as New Orleans may be reached by railroad, automobile road or water route, the manifest destiny of these lands is to become an intensely cultivated farm garden, with an ultimate value on the land of hundreds of dollars an acre. All kinds of general farming operations are also engaged in here now, and cattle and hogs thrive wonderfully, running in the open all through the winter months and keeping in fine condition with little or no feeding at any time.

There are pecan groves on a portion of the tract, Louisiana being the home of the pecan, and some attention is being given to the raising of citrus fruits.

The advent of the Funk interests came about through a notable excursion made to Southern Louisiana in the summer of 1910. David Rankin, the great Missouri corn grower; three of the Funk brothers of Bloomington, Ill.; farmers, soil experts, agricultural college professors, and chemists and capitalists from Illinois, Wisconsin, Iowa and elsewhere were brought here in a special car at the instance of Edward Wisner and taken out to the reclaimed lands at Raceland, Lockport and elsewhere, and also to some of the orange groves on the river "front lands." Exhaustive soil tests were made, and investigations as to conditions of all kinds, including health, and formal reports were made by the experts and others. At one place a field of corn was shown that had been sown broadcast following a stubble breaker, and never had been cultivated. The growth was so luxuriant that the corn had choked out grass and weeds, and on the rank stalks 8 to 12 feet high were well-filled ears that afterwards showed a yield of 65 bushels to the acre. David Rankin, up to the time of his death the greatest corn raiser in the country, having some 30,000 acres devoted entirely to corn, voiced his astonishment at what he had seen, declaring that in all his experience he had never found conditions such as these. If he were a young man, he said, he would want nothing better than to establish a corn farm in the Louisiana delta.

Mr. Julius F. Funk declared this trip was a revelation to him, and Mr. Dean Funk, president of the Funk Bros. Seed Co., Bloomington, Ill., declared: "In the Louisiana delta the Northern corn grower will find his Utopia. No soil in the world contains more of the elements essential to the maximum crop of corn." Mr. Eugene D. Funk, president of the National Corn Growers' Association, said "an average corn crop in the delta country of Louisiana should be 100 bushels per acre."

Mr. F. G. Baer, chief chemist of the Ohio State University, reported that there is enough nitrogen in the first eight inches of this soil to supply fertilizer for one thousand 50-bushel crops of corn.

Prof. F. S. Klink, Iowa Agricultural College, reported: "The range and excellence of the crops, both agricultural and horticultural, is the strongest possible evidence of the adaptability of these reclaimed areas for agricultural purposes."

Corn growing and stock raising, with which the visitors were most familiar, were declared to be two lines of activity in which remarkably lucrative returns could be counted on with anything like the attention given to them that is done in the North. That Louisiana has peculiar advantages as a corn State has been demonstrated by the fact that corn matures early here, and, being thoroughly sun dried, contains only 12 to 15 per cent. of water when ready for market, making it the driest corn grown anywhere in the United States. Its phenomenal dryness gives it unusual keeping qualities and especially fits it for export purposes.

Investigation as to climate and health conditions showed that since the discovery that yellow fever is disseminated solely by the *stegomyia* mosquito, and science having also learned how to handle and prevent other subtropical fevers, and along with improved conditions that come with extensive drainage operations, the healthfulness of Louisiana is greater than in many other parts of the country much farther to the north. Weather Bureau reports also showed

that most erroneous ideas prevailed about the heat. While the whole North, even as far up as interior Canada, sometimes swelters in 100 to 115-degree weather, lower Louisiana almost never experiences a higher temperature than 95, and even in July the maximum may run under 90 for days at a time, with always a refreshing breeze from the Gulf.

Proximity to the Gulf tempers the heat of summer as well as the cold of winter.

Finding conditions so favorable in every way, negotiations were shortly entered into by the Funks for the purchase of a tract, and the well-located site at Paradis was bought from Messrs. Wisner and Crawford, and drainage work, already undertaken, was extended. It is the purpose of the Louisiana Delta Lands Co. to so completely drain and protect their entire holdings that no

combination of floods or crevasse can ever again menace them.

Additional acreages have been secured since the initial purchase. They, too, will be thoroughly prepared for cultivation, and so enthusiastic are the members of the company that arrangements for further operations are likely to be made.

#### R. H. & G. A. McWILLIAMS.

Credit for the important part of a pioneer in dredging operations in Louisiana is due Mr. G. A. McWilliams of the contracting firm of R. H. & G. A. McWilliams of Walnut, Ill. Although still a young

man, Mr. McWilliams had been for many years prominently identified with drainage projects in various parts of the country from Wisconsin and Michigan down through the Mississippi Valley as far as Southern Illinois. Through information supplied by the Manufacturers Record, Mr. McWilliams began investigations as to conditions in Louisiana during the summer of 1908. In 1909 O. W. Crawford spent several weeks with Mr. McWilliams at his home in Walnut, with the result that Mr. McWilliams came to Louisiana shortly afterwards and devoted some time to the investigation of conditions here. The result of this visit was a contract entered into between Mr. McWilliams and the Truck Farm Land Co., one of the Wisner companies, by which a considerable tract of land was to be drained in St. Charles parish, and the cost paid for in wet lands, also in St. Charles parish. Subsequently, Mr. McWilliams added to his holdings further large acreages by purchase, so that at the present time he owns 13,800 acres of choice lands in a compact body in St. Charles parish. Much of this tract has been ditched and partly drained, and will unquestionably be ultimately fully developed and occupied by farmers and truck-growers from the North. Mr. McWilliams has expended something like \$100,000 in improving the tract and making the initial developments required to put the large holding in complete shape for cultivation.

#### GEORGE A. HERO.

Nothing could more forcibly demonstrate the newness of the reclamation or drainage movement than the fact that only just now has a district been organized, which embraces territory immediately across the river from New Orleans. Included in the district are the cities of Algiers and Goudsboro in New Orleans parish, and McDonoughville, Mechanicham, Gretna and the settlement at the head of the Harvey Canal in Jefferson parish, but this district also takes in 26,200 acres of undrained and uncultivated back lands, comprising all the territory south and west of the Mississippi River, back to the Harvey Canal and Bayou Barataria, and south to a line produced from Bayou Barataria southeast to the Mississippi River, a distance south of Algiers of about 10 miles. The simplicity of the drainage problems, the proximity to New Orleans, with every sort of rail and water transportation and the great fertility of the soil justify the comment of Mr. J. F. Coleman, consulting engineer, that it is hard to understand why the enterprise was not carried out long ago.

Nevertheless it has taken some right hard work to put the undertaking on its feet. The moving spirit in the enterprise is Mr. George A. Hero, 309 Cotton Exchange Building, New Orleans, who is president of the Jefferson-Plaquemines Drainage District that has been formed, as provided by law, to do the work of drainage. When the project was finally whipped into shape the possibilities and advantages became so apparent that the \$250,000 bond issue required for drainage work was readily sold to Northern land buyers—the First National Bank of Columbus, O., which has also taken over the Bayou Cane Land Co.'s issue of \$142,000.

The lands within the district are especially favored for drainage; they are almost surrounded by the Mississippi levees, and need levees for only a short stretch along Harvey's Canal and from thence to the Mississippi River at the lower line of the Cedar Grove Plantation, the southern boundary of the dis-



NORTHERN INVESTORS ON RECLAIMED LANDS. NOVEMBER, 1912. "HURRAH FOR LOUISIANA."

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S. DAVIES WARFIELD, President

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OF RICHMOND, VA.

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Surplus, - - - 1,000,000  
Deposits, - - - 14,000,000  
Resources, - - - 20,000,000

WM. M. HABLSTON, Chairman of the Board  
JNO. B. PURCELL, President JNO. M. MILLER, Jr., Vice-President  
W. M. ADDISON, Cashier

ESTABLISHED 1865

## MARYLAND TRUST COMPANY BALTIMORE, MD.

### Statement of Condition at Close of Business December 31, 1912

ASSETS.	
Cash on Deposit and in Hand.....	\$206,873.88
Due from Banks and Bankers.....	93,029.26
Loans on Collateral:	
Demand .....	\$1,215,255.89
Time .....	71,181.26
	1,286,437.15
Other Current Assets.....	41,472.21
Investments:	
Sundry Bonds, Stocks, Syndicate Participations, etc.....	\$1,135,019.05
City of Baltimore 3½ per cent. Stock....	296,484.00
Maryland Trust Building Co., entire Bonds and Stock..	525,000.00
	1,956,503.05
Office Furniture and Fixtures.....	2,000.00
Total Assets.....	\$3,586,315.55

LIABILITIES AND CAPITAL.	
Deposits:	
Individual .....	\$1,054,923.02
Banks .....	110,141.64
Savings .....	21,151.58
Trust Accounts.....	454,857.93
	\$1,641,074.17
Certified Checks.....	125.18
Total Liabilities.....	\$1,641,199.35
Excess of Assets over Liabilities represented by:	
Undivided Profits....	\$445,116.20
Preferred Capital Stock .....	500,000.00
Common Capital Stock .....	1,000,000.00
	1,945,116.20
NOTE:	
Undivided Profits before Dividend....	\$475,116.20
Less Dividends on Preferred Stock paid during year..	30,000.00
Balance of Undivided Profits, as above....	\$445,116.20
Total Liabilities and Capital.....	\$3,586,315.55

Accounts Solicited.  
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OSCAR G. MURRAY, 1st Vice-President.  
CARROLL VAN NESS, 2d Vice-President.  
JERVIS SPENCER, JR., Sec. and Treas.  
IVAN SKINNER, Assistant Secretary.  
Assistant Treasurer.

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Joseph I. France, Baltimore.  
\*Robert Garrett, Baltimore.  
Rufus M. Gibbs, Baltimore.  
\*B. Howell Griswold, Jr., Baltimore.  
George Carr Henry, New York.  
A. Barton Hepburn, New York.  
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Arthur G. Wellington, Baltimore.  
\*Henry B. Wilcox, Baltimore.  
Douglas M. Wylie, Baltimore.  
L. S. Zimmerman, Baltimore.  
\*Members Executive Committee.

We have examined the books and accounts of the Maryland Trust Company, and WE HEREBY CERTIFY that the above statement correctly sets forth the Company's condition at the close of business on December 31, 1912.

New York, January 18, 1913.

(Signed) HASKINS & SELLS, Certified Public Accountants.

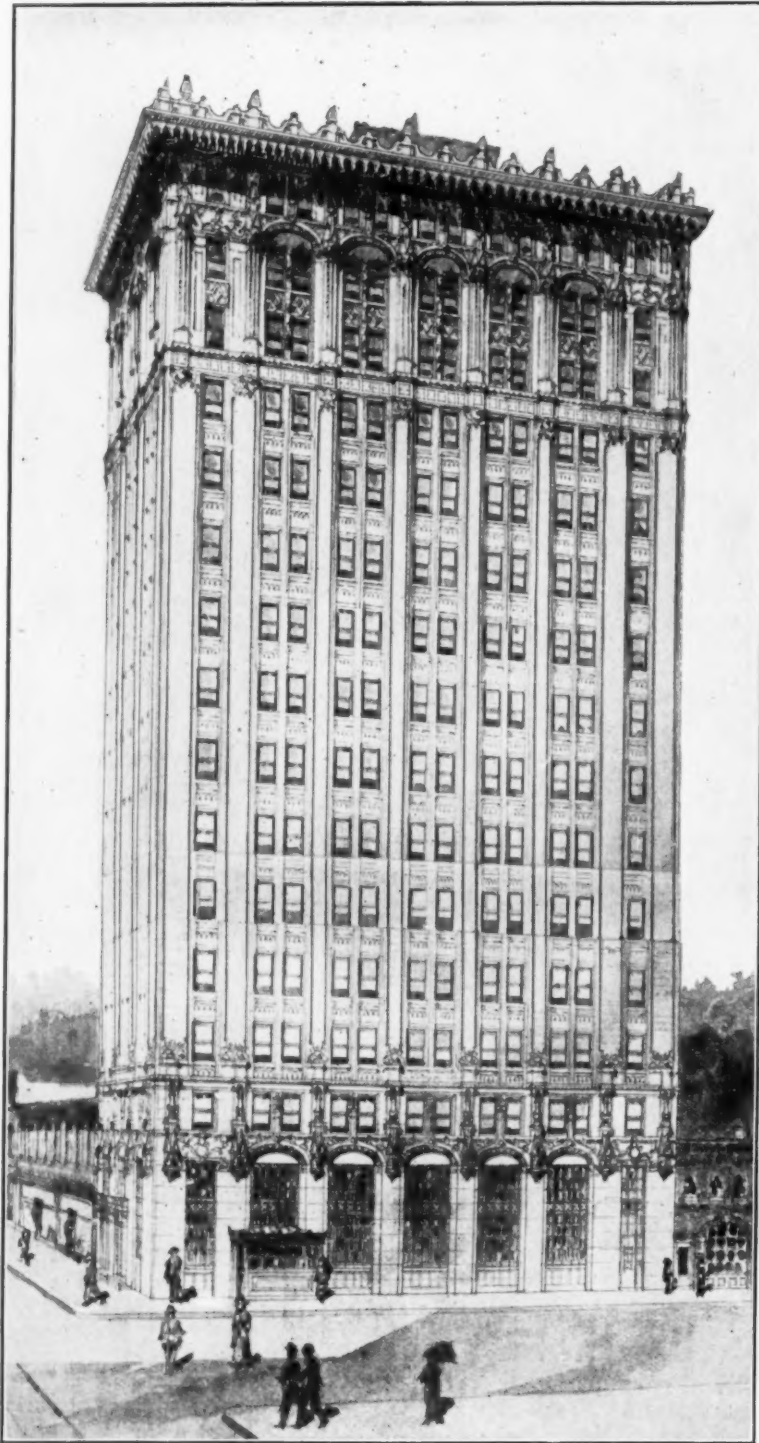


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of

## COLUMBIA, S. C.

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THE CENTRAL SOUTH  
ATLANTIC STATE



THE 1913 HOME  
of  
THE PALMETTO NATIONAL BANK

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Surplus and Profits

\$150,000.00

Deposits

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JOHN JACOB SEIBELS, Vice-President

THOMAS TAYLOR, 2nd Vice-President

J. P. MATTHEWS, Cashier

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TOM O. SMITH, Vice-President  
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BENSON CAIN, Asst. Cashier  
C. D. COTTEN, Asst. Cashier  
E. W. FINCH, Asst. Cashier

## Birmingham Trust and Savings Company

Capital, . . . . \$500,000.00  
Surplus, . . . . 550,000.00

**BIRMINGHAM, ALABAMA**

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TOM O. SMITH, Vice-President.	R. S. MUNGER, Director Continental Gin Co.
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JNO. H. SOUTHALL, Treasurer

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JONATHAN BRYAN Real Estate	L. Z. MORRIS President Savings Bank of Richmond
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Capital,	. . . . .	\$1,000,000.00
Surplus,	. . . . .	250,000.00

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MAKE THIS BANK YOUR BANK

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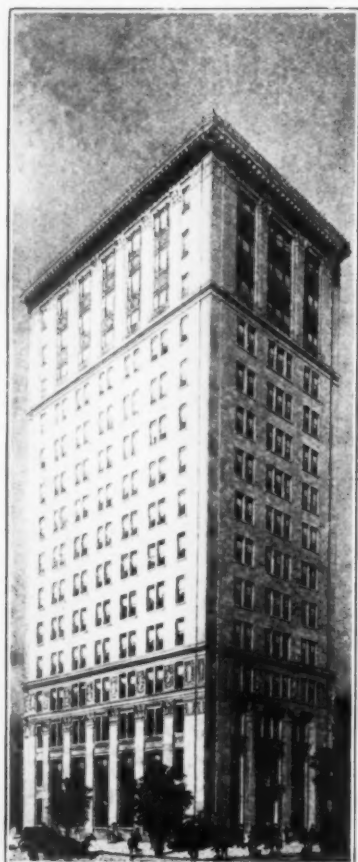
**A Southern Financial Stronghold**

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4% per Annum Paid On Savings Accounts—Computed Quarterly

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Southern Investment Securities

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Correspondence Invited

WE BUY

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We solicit correspondence from Public Officials, Contractors and others having bonds for sale. We specialize in Southern Securities and can handle all Contracts promptly.

## Peoples Bank of Anderson

ANDERSON, S. C.

PAID-UP CAPITAL . . . \$200,000.00

We offer the complete service of a safe, solid and conservative bank

Special and personal attention given to collections

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Assets over \$6,000,000



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An Engineering Department prepared to Examine and Report on Industrial Developments.

CORRESPONDENCE SOLICITED

## Investing Millions In the South

"NEW WEALTH"—the legitimate creation of productive ability—finds its greatest development in many parts of the South. Recognizing this vital fact and its ever-growing importance, this House in recent years has handled millions of dollars of the best classes of

### SOUTHERN

Public Service Corporation Bonds  
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And other securities having proven, known value

We are constantly in the market, with a two-fold service:

TO THE INVESTOR, we offer the facilities of a peculiarly well-equipped organization, able to supply him with the very "cream" of investment offerings.

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How may we best serve YOU? Write us freely and frankly, that we may offer our facilities in either of the above divisions to YOU.

"A Record of Investments" will interest every holder of bonds.  
Sent on request.

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**WAYCROSS SAVINGS AND TRUST CO.**  
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Capital and Profits, - - - \$175,000

**6%** PAID ON SAVINGS DEPOSITS.  
Coupon Certificates issued, interest payable quarterly in four detachable Coupons  
ALL LOANS SECURED BY REAL ESTATE ON A 3 TO 1 BASIS

### Texas Farm Mortgages are Excelled by None

For adequate safety and security with substantial dividend yield. For—17—years we have been making farm loans in North Central Texas, and have never had a suit or foreclosure, and have now no past interest due, which is certainly evidence of our ability and success in safeguarding the interests of our clients.

THE MOST CONSERVATIVE  
Life Insurance Companies in the Union invest in our North Central Texas Farm Mortgages. Write for booklet showing the REASON our farm mortgages are safer than bonds, yield larger dividends, and why you should buy them.

**A. Y. CREAGER CO., Farm Loans**  
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**6%** When you purchase from us a mortgage on *Improved Georgia City or Farm Property* you take as little chance as is humanly possible. You receive from 6% to 7%, and you can be sure of receiving it regularly. Your principal is amply protected. Let us send you our list of Loans and some very reliable literature.  
**SESSIONS LOAN & TRUST CO.**  
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### OPPORTUNITY FOR PRACTICAL FOUNDRYMAN

with \$10,000 to invest as working capital in a well located and equipped foundry and machine plant now in successful operation at Johnson City, 10,000 population. Only plant serving a large and prosperous territory.

Only practical man with first-class references desired.

S. C. WILLIAMS JOHNSON CITY, TENN.

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Factory Sites with Deep Water and Belt Line Connections  
303-304 Arcade Building, - - - NORFOLK, VA.

## MONEY TO LOAN On Downtown Business Properties IN CITIES HAVING A POPULATION OF 30,000 OR OVER

¶ We will finance that new building for you on our *serial payment* plan. By this plan the loan is repaid in annual installments.

¶ If you contemplate erecting a new building or refunding an existing loan on business property, get in touch with us. Correspondence and interviews invited. Address

REAL ESTATE LOAN DEPARTMENT

**MERCANTILE TRUST COMPANY, - - - Saint Louis, Missouri**  
Capital and Surplus - \$9,500,000

FESTUS J. WADE, President

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## COOKE, HOLTZ & CO.

### INVESTMENT SECURITIES

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Incorporated  
 Cash Capital \$500,000

We purchase entire issues of Public Utility Corporation Bonds and Debentures, in amounts of \$500,000 and upwards, issued by well-established properties, serving prosperous and growing communities; also entire issues of Municipal Bonds of Counties, Cities, Towns, School Districts and Drainage Districts.

We invite correspondence with Bankers, Dealers, or Operators of Public Utility Corporation properties with reference to the financing or sale of such properties.

#### WE OWN AND OFFER

an attractive selection of Municipal and Public Utility Corporation Bonds yielding from 4½% to 6%, suitable for the investment of the funds of Estates, Banks, Institutions and Private Investors.

Descriptive Circulars Sent on Request

39 South LaSalle Street

CHICAGO, ILLINOIS

## ASSETS REALIZATION COMPANY

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Capital and Surplus, \$11,000,000

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Finances established enterprises handicapped by inadequate capital. Buys short term bond issues on operating properties. Special facilities for investigation and supervision anywhere in United States.

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[CORRESPONDENCE INVITED]

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25 BROAD STREET  
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LAFAYETTE BLDG.  
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## WE BUY MUNICIPAL BONDS

City, Town, County, School  
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Our twenty years' experience insures prompt and efficient service

---

Cutter, May & Company  
 THE ROOKERY CHICAGO



# The Wm. J. Oliver Manufacturing Company

## An Important Factor In Southern Development

**A**MONG the manufacturing concerns that are here and there achieving distinction in giving the South a broader and more significant development along industrial lines and making known its potentialities throughout this and foreign lands, that of the Wm. J. Oliver Manufacturing Co., at Knoxville, Tenn., occupies a unique place of importance. Its various products are finding their market not only in every section of this country, from the Atlantic to the Pacific, but in other countries as well, from Canada to Brazil, and even to far-off New Zealand.

The plant covers, with its yards and buildings, over forty acres. It is located on the tracks of both the Southern and the Louisville & Nashville railroads. It has shops of various kinds for the manufacture of the numerous kinds of products made by the company and for extensive repair work for contractors, mill men, coal mines and railroads. The principal buildings are the main shops, 572x166 feet; the foundry building, 418x134 feet; the wood-working shop, 280x100 feet; the grinding-room, paint shops, etc., a very large storeroom, pattern-house and spacious office building. The equipment is thoroughly modern, and embraces every kind of machinery needed in handling the various branches of the company's business. It is especially adapted to doing jobs of the larger kind, and some classes of work done here cannot be turned out elsewhere in the South. The machines are all driven by independent electric motors, the current for which is generated at the central power-house. The main building has two 50-ton electrically-driven traveling cranes, the foundry building two of the same character that are capable of handling 20 tons, and the woodworking shop one also of 20-ton capacity. In fact, the plant is built and equipped especially for the rapid and economical handling of work of the larger kind.

The Oliver company is engaged in manufacturing dump cars, railroad flat cars and general contractors' equipment, mine equipment, logging cars, quarry equipment, marble-finishing machinery and plows, and to do, in addition, a general repair work on engines, boilers and all other kinds of contractors' and railroad equipment.

In the matter of dump cars, it makes a specialty of the Oliver Two-Way Air Dump Car, a product that embodies the last word in contracting equipment. The regular sizes in which these cars are made are 12-yard, 16-yard, 20-yard and 30-yard, though other sizes are made to order when preferred.

These sizes are standard-gauge cars, built according to M. C. B. specifications throughout and equipped with government safety appliances. They are moved on their own wheels from place to place. The other standard-size cars manufactured are the 4-yard and 8-yard 36-inch gauge used by contractors and industrial plants. The improved Oliver 4-yard car, which is built with one of the strongest trucks, has been pronounced by a great many of the leading contractors as the best 4-yard car on the market.

The Oliver double-truck 8-yard car, 36-inch gauge, has also proven itself to the contractors to be far superior to any other car built where they have long hauls. Other sizes and types of cars are also built as ordered.

The 12-yard and 20-yard air dump cars, which may be considered a standard car with railroads and contractors using standard-gauge equipment, have two draft sills consisting of 15-inch steel channels weighing 45 pounds to the foot, with a substantial number of separators, cover plates, etc., riveted up in a substantial workmanlike manner, eliminating all castings subject to the falling of rock and such material, and substituting in their place forgings and steel plates. These cars are equipped with any type of M. C. B. automatic couplers which the purchaser desires. The bottom of these cars is of 3-inch white oak, or can be of all steel if wanted, with 10-inch center channel beam 33 pounds to the foot, running full length of the body, and also has two intermediate 4x6x $\frac{3}{4}$  angle irons, and two outer angle irons of 4x6x $\frac{3}{4}$ , all running the full length of the bottom. Between the two intermediate angles are placed seven truss angles, distributed the entire length of the body. These trusses are made of 3x3 $\frac{1}{2}$ x5/16-inch angle iron. The outside angle is trussed by two 1 $\frac{1}{2}$ -inch rods with turnbuckles. The body of the car is pivoted to draft sills by nine hinges, which are securely riveted to the draft sills, and the top hinge casting riveted or bolted to the 10-inch center channel on the bottom of the car. These castings are pivoted together with 1 $\frac{1}{2}$ -inch steel pins. The ends of these cars are built of either 3-inch white oak timber or 5/16-inch steel plate, securely fastened to the bottom of the car, and are braced from the center by means of a malleable casting riveted to the end and to the center channel of the bottom. The doors are constructed of steel 3/16-inch plate, reinforced horizontally at top and bottom by two 6x4x $\frac{3}{4}$  angles, securely riveted to them, running the entire length of the doors, and between the two angles 23 Stiffener angles of 3x2 $\frac{1}{2}$ x

5/16-inch are used. The cars are equipped with either New York or Westinghouse latest improved air brake equipment. Trucks are of steel construction, according to M. C. B. specifications, with capacity to suit the different sizes of the cars. The capacity of these trucks is from 50,000 to 100,000 pounds.

The air dump cars are equipped with a cylinder hung upright on each side of car. The piston rod for the cylinder is fastened to the bottom of the car at one end and to the piston at the other. Two reservoirs are put on each car, being placed between the draft sills, which insures absolute protection against falling rock. Air is supplied to the auxiliaries from the train line pipe with a check valve between, thus preventing the air from returning from the auxiliaries to the train line pipe. A valve is placed on the end of each car, with pipe connections running from the auxiliary and from the valve to the dumping cylinder, and either of the cylinders dumping the car on the side which they want to unload, and releasing this cylinder and admitting air into the other one rights the car. This car is under absolute control of the operator, and he can stop the car even after it is past the center of gravity, which enables the user to dump in any quantity desired.

A feature of special value is the toggle or lever arrangement for dumping the car, by which the lower edge of the door is thrown upward and away from the contents of the car, thereby minimizing the liability of any materials striking against the door and springing or wedging it. The lever performing this function also locks the door rigidly when the car is standing in a horizontal position. This is one feature of this car that is thought to be unequaled in cars of other makes. It appears on all Oliver dump cars.

Only one line of pipe is necessary to operate both the air dumping device and the air brake. Cars thus equipped permit any locomotive with standard air brake equipment to operate the air brake cars without having to equip the locomotive especially for air dump cars. A train of Oliver air dump cars can be taken to the unloading or dumping place and the locomotive cut loose from the cars, and they will still have enough air in the auxiliary of each car to dump the same three times. Any laborer can handle the Oliver air dump cars with as much ease and safety and get the same result as a mechanic or expert. These cars are also equipped so that the locomotive engineer can dump the cars and right them from the locomotive.

This car carries a large load; it can be dumped by one man; it is substantially built, and will withstand rough usage; it is built according to M. C. B. specifications, permitting the user to secure repairs in any railroad shop. The air for dumping is applied directly to the car body. It is dumped either side and righted by the move of a simple lever on the end of the car or on the locomotive.

The Oliver two-way air dump car appealed so strongly to the Government's construction engineers that they ordered 1400 for use in the Panama Canal work. They were sent to the Isthmus in 1908, and have been giving general satisfaction ever since.

Other notable users of these cars are hundreds of contractors, the Utah Construction Co., the Utah Copper Co., the Chino Copper Co. of Utah, Florida phosphate companies, the Lehigh Valley, the Missouri, Kansas & Texas and other railroads, and also the Canadian Northern, which is building through Northwest Canada. An order for 50 cars has just been filled for the Brazil Railroad Co., Soro Santos, Brazil.

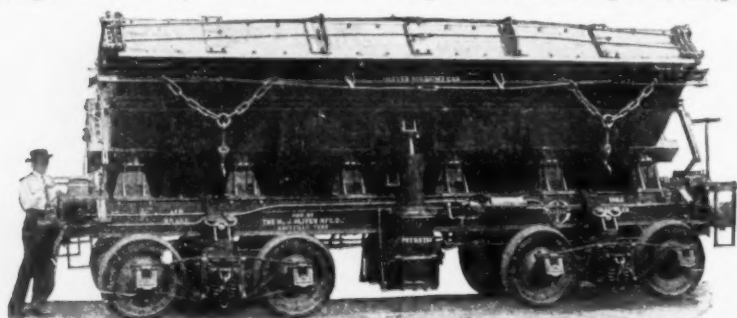
Dump cars of other types are made by the Wm. J. Oliver Manufacturing Co., but practically all of them bear the essential Oliver features described above, with such modifications as are suitable to their size and the particular purposes for which they are intended.

In mine equipment the company manufactures tipples, drums, screens, mine cars and monitor cars for coal mines, marble quarries and limekilns. These cars are all of special design, gotten up by experienced mining engineers and draftsmen.

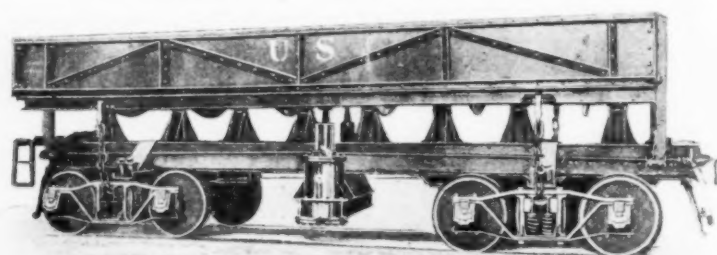
The equipment for marble quarries which the Oliver company makes embraces finishing machinery, rubbing-bed outfits, Hurst frames, derricks, and various kinds of special appliances needed in that character of business.

The plant is fitted for doing a general repair work in all the lines it manufactures, and many more besides, including steam shovels, locomotives and cars of all kinds.

Next to its special line of dump cars the most important part of the Wm. J. Oliver Manufacturing Co.'s product are plows, and first in importance among these is the special brand known as the Wm. J. Oliver Improved Chilled Plow. This implement combines within itself so many excellent features that it seems



12-YD. AIR DUMP CAR WITH STEEL UNDERFRAME AND WOOD BODY.



19-YD. ALL-STEEL AIR DUMP, FURNISHED THE U. S. FOR PANAMA CANAL.

to have them all, and stands unequaled as an implement of husbandry made to meet all possible contingencies.

The making of plows was added to the business of the Wm. J. Oliver Manufacturing Co. in 1908, when it bought out the plant and business of the Ground Hog Plow Co. and proceeded to further improve this plow by features patented in 1909, after which it began to make plows in earnest and to lay plans for selling them. The excellence of the plows and a selling campaign waged with vigor and intelligence brought in a few months a phenomenal demand for the Wm. J. Oliver Improved Chilled Plow, and before long its use was nationwide. Within the last few months, indeed, the demand has overstepped continental limits, and a big shipment of plows has been sent to New Zealand.

The Wm. J. Oliver Improved Chilled Plow boasts a locking device that adds greatly to the strength of the implement and preserves its original shape during its life. This prevents the plow from becoming loose and "rickety" in the joints or untrue or out of alignment. It is absolutely simple in construction, and the boy on the farm can take it apart or put it together as well as the man in the shop. It "runs true" in the furrow.

It is the only plow made that has interchangeable parts. When the owner of any other make of plow breaks some part and goes to town to get a new one he must remember the number of his plow, or the merchant will not know what to give him. When the owner of the Wm. J. Oliver Improved Chilled Plow breaks a part he goes to the merchant who sells the Oliver and tells him what part it is he wants, and gets it. The dealer in the Wm. J. Oliver plow carries but one kind of extras—they fit all kinds of Wm. J. Oliver improved plows. The plows are made with both steel and wooden beams, and everything about them, from point to handles, and from mouldboard to clevis, is of the best material and the best workmanship. The company is making about 100 different varieties of plows, with an annual output close to 50,000.

As the product of any manufacturing establishment can only equal the sum of the knowledge of that product possessed by the men employed by that establishment, the personal factor must enter largely into the manufacturing equation. What, then, is the knowledge, gained from experience, possessed by those who are active in the management of the affairs of the Wm. J. Oliver Manufacturing Co.?

William J. Oliver, founder of the company, its president, and its presiding genius in fact as well as in name, is a member of the Indiana family which for two generations has made the name Oliver known wherever an up-to-date plow is appreciated. When he struck out for himself he came South and engaged in the business of building railroads, as a contractor, in which he had amassed a fortune of a million dollars before he reached middle life. He mastered the contracting business in all its details. He knew every nut and every bolt in every machine he used in his work, and when something wore out or broke he knew just how much it ought to cost to repair or replace it. Finding that he was paying too much for his repair work, he bought out a foundry and machine shop where he could repair his own machinery. With a thorough knowledge of the work required of the equipment for the contractor's business, he added from time to time improvements to the machines he hauled into the shops for repairs, and the consequence was that in the course of time certain things had been so often repaired and improved that they were more William J. Oliver products than the products of the plants which had manufactured them in the first place. This brought about the manufacture of such things in their entirety, with all the improvements which experience had suggested. In the matter of dump cars, for instance, Mr. Oliver knew the weakness and the strength of each individual part of each individual make of car, and each and every criticism made by his contractor friends and associates was considered. From this knowledge sprang the car which bears his name, and which has demonstrated its superiority from the Atlantic to the Pacific and from Canada to Brazil.

Mr. Oliver is president of the Knoxville, Sevierville & Eastern Railroad, and owner of the Savannah, Augusta & Northern Railroad, and connected with many other important business enterprises throughout the South. As a contractor he executed some of the largest contracts in the construction of railroads ever given to one man, and always with an expedition and a thoroughness that gave satisfaction to those who had the bills to pay. When the United States Government called for bids for the construction of the Panama Canal, Mr. Oliver was among the bidders who responded, and his bid was found to be the lowest and best. He qualified in every respect with all the requirements of the Government, and would unquestionably have been awarded the contract to do that great piece of constructive work had it not been that it was decided that the Government would itself do the work under the supervision of its army engineers.

Mr. Oliver, who is still on the sunny side of fifty, is an active, enterprising man, full of aggressiveness, and never so happy as when engaged in some great piece of constructive work that calls for the exercise of skill, energy and financial daring.

The vice-president and general manager of the Wm. J. Oliver Manufacturing Co. is L. E. Wooten, who began his business career at the age of thirteen as an apprentice in a railroad machine shop. Having served his term, he worked his way through the various positions in the shop, learning the details of car and locomotive construction, and then became a locomotive engineer before he was twenty-one years of age, with Mr. Oliver, on construction. From this position he became superintendent on some of Mr. Oliver's construction work, where he became fully conversant with the various kinds of equipment in use in such work. He afterwards served as general manager of the Savannah, Augusta & Northern Railroad, and then built the Knoxville, Sevierville & Eastern Railroad and operated it for some time. In these various positions Mr. Wooten became thoroughly familiar with dump cars of all kinds, and when, in 1908, Mr. Oliver secured the contract to deliver 1400 of his dump cars to the Isthmus of Panama for use in digging the Canal, he was selected by the superintendent of motive power on the Isthmus as superintendent of construction to erect the cars, which were shipped in a "knocked-down" condition. In that capacity he served the Government for eighteen months, gaining a still deeper insight into the requirements for an efficient dump car and how to perfect its construction. When he returned to Knoxville he was made vice-president and general manager of the company, bringing to the duties of that position a practical knowledge of dump-car construction not equaled, perhaps, by that of any other man in the country. This knowledge, gained from experience in actual shop training, as well as in the practical operation of dump cars on construction work, Mr. Wooten is exercising, with all the energy of a highly-energetic nature, in keeping the output of the company up to the highest standard of excellence, and in adding wherever possible such things as may tend to the further perfection of what he believes to be the most perfect dump car now being made.

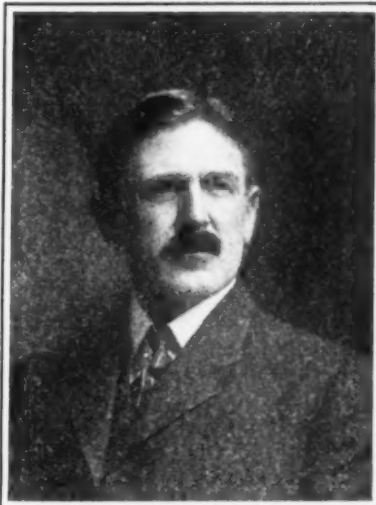
Thomas Price Roberts, superintendent of the shops of the Wm. J. Oliver Manufacturing Co., served his apprenticeship as a machinist in the shops of the Asa Blevin Manufacturing Co. of Elmira, N. Y., builders of stationary engines, etc. He went to Knoxville when still a very young man and connected himself with the Knoxville Foundry & Machine Co. as machinist, a position he held for ten years. Later he was connected with the East Tennessee, Virginia & Georgia Railway, and with its successor, the Southern, for twenty-one years as machinist, toolmaker, foreman and general foreman. From that employment he went to the Wm. J. Oliver Manufacturing Co. in 1905 as superintendent of shops, a position he still holds. Mr. Roberts has supervision of the shops and oversees the construction of all the cars and other articles turned out from them. To this work he brings the same ripe experience and the same attentive energy that have made him a valuable man wherever employed.

The head of the plow department is J. R. Rossetter, a man who has spent many years in the plow-selling and plow-making business, and who unquestionably knows as much about the practical construction of those very useful implements as any other man anywhere. After serving for seven years in a plow-manufacturing concern, learning every detail connected with the construction of plows, Mr. Rossetter conceived an idea for making an improved chilled plow. This plow he afterwards perfected, patented and manufactured for a number of years, until he sold his business and patents to the Oliver company. The original line has been considerably reinforced by the addition of plows of various other types, all of which embody the same patented features as the regular series of chilled plows. Mr. Rossetter has been at the head of the company's plow department since 1909, applying his knowledge and experience to turning out the best possible work, and always striving to find some way to improve an article that already seems to be well-nigh perfect.

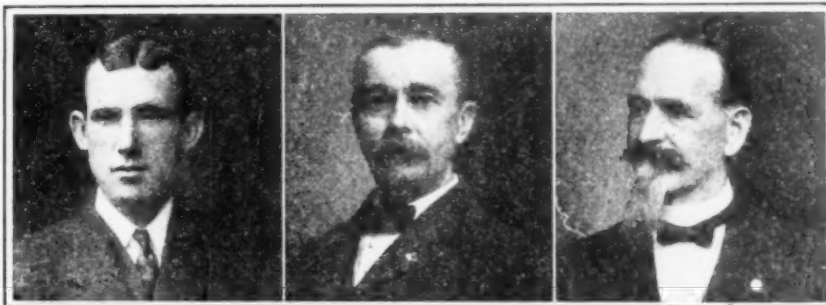
Thus it will be seen that Mr. Oliver not only is himself thoroughly experienced in the various lines of business to which his company is devoting itself, but, with the genius of the true leader of men, he has brought to his aid, and placed at the heads of the different departments of the plant, men of the broadest practical experience in their respective lines, to the end that whatever work is turned out of the plant shall be the best of its kind—made and finished in the highest state of perfection of which human skill and human ingenuity are capable—the product of brains and experience and inventive genius.

The motto the Wm. J. Oliver Manufacturing Co. works into the products of its plant is: Nothing but the best is good enough to bear this company's name.

The opportunities offered by the South to men of broad vision and energy for the creation of great enterprises are aptly typified in the history of the Oliver company. It is for this reason this story is published. Specific illustrations of what has been achieved in the South furnish the proof, if any were needed, to sustain the claims made in "The South: The Nation's Greatest Asset" as to the illimitable resources and possibilities of this favored land.



WM. J. OLIVER.



L. E. WOOTEN.

T. P. ROBERTS.

J. R. ROSSETTER.



# The Arkansas Colonizing Company

INCORPORATED

CREATED BY AN ARKANSAS WOMAN'S ENERGY AND BRAIN

## Lands



WITH the value of the products of its factories rated in 1912 at \$92,000,000; of its farms at \$168,375,000; of its forests at \$54,008,000, and of its mines at \$5,600,000, Arkansas shows a remarkable advance in general development.

Such a splendid showing could not have been possible had not Arkansas a soil and climate suitable to raising a wide range of products, vast forests of valuable timber, rich deposits of minerals in great variety, and all the needed advantages and requirements for manufacture.

Arkansas, agriculturally, is a wonderful State—a State in which the varying elevation from the Missouri line to the boundary of Louisiana gives it a sufficient number of degrees of latitude to enable farmers to raise semi-tropical crops and those of the temperate zone.

The advance in the value of farm products in Arkansas has been a notable one. In 1890 these were worth \$53,128,000; in 1900, \$79,649,000, and in 1912 they advanced to the splendid total of \$168,375,000, a complete and most convincing evidence not only of the richness and productivity of its soil and climate, but also of the increased attention which is being given to farming. Arkansas yields annually about 1,000,000 bales of cotton, valued at \$50,000,000 to \$75,000,000, and 60,000,000 bushels of corn, worth \$40,000,000. The growing of rice has also proven a very profitable industry in the State. Twenty years ago Arkansas was raising only a few hundred bushels, while last year there was a production of 3,405,000 bushels, valued at \$3,201,000. Ninety thousand acres were devoted to this crop, and the average yield per acre was 37.5 bushels, exceeding the average yield of all other Southern States. Conditions in Arkansas have likewise been found to be exactly suited for cattle-raising and dairy farming. Truck-growing has also reached large proportions, for this State is well situated in relation to the country's big consuming markets, and hundreds of carloads of vegetables of most every variety are shipped annually. Arkansas' orchards in the highland sections of the State are now famous for the variety and quality of fruits raised, and this industry is now of large commercial importance. Another indication of Arkansas' advancement is the fact that values of agricultural lands have increased 123 per cent. in the last five years.

In comparison with other States, Arkansas is a leading one in timber production, ranking fifth, with an annual cut of more than 1,750,000,000 feet. There is still an abundance of standing timber for the future development of this industry, as this State has an area of 22,400,000 acres of different woods of value, estimated to contain thirty to fifty billion feet.

The minerals of Arkansas cover a wide range, including coal, lignite, bauxite, asphalt, zinc, lead, clays, marble, phosphate rock, fuller's earth, soapstone and building stones. Natural gas, too, has been found within the confines of the State, and a number of valuable wells are producing steadily.

These many raw materials for manufacture supplied by the variety of the State's mineral and timber resources, together with its coal, lignite, natural gas and hydro-electric power available through its many rivers, combine to present opportunities for manufacture that are most inviting. And when it is considered that the value of manufactured products of Arkansas advanced from \$45,198,000 in 1900 to \$92,000,000 in 1912, or more than double, there can be no question as to general all-around advantages this State possesses for manufacture.

These are some of the reasons to which can be attributed the rapid growth of the State in recent times. For years, during the time that the Indian Territory was closed to settlement, Arkansas developed slowly. When that Territory and Oklahoma became a State, the gates of Arkansas admitted the people of the world who flocked across her border. In passing, these people beheld for themselves Arkansas' vast storehouse of riches. Many having been impressed with these remembered them, and came to settle here, and also induced others to follow them.

Many forces are now working to bring Arkansas' advantages to the attention of prospective investors, manufacturers and new settlers. There is a co-operation in this work between real estate and colonization companies, the railroads and the State officials, and the splendid results being achieved are reflected by the notable advance which Arkansas is making in every line of activity.

A leader in the development of Arkansas is an Arkansas woman, the president of one of the leading real estate and colonizing companies of the Southwest, a woman of rare business talents, and who has made a tremendous success without in the least losing the attraction of the eternal feminine. The daughter of a minister, a teacher, a model of womanly propriety—a success in business life as she is in the private circles. A few years ago holding a most important clerkship in the Arkansas Legislature, so well was her work performed that when Oklahoma's first legislative session was held they sought and secured her services, and she won the gratitude of the business people of that State to the same degree that she held it in Arkansas.

This woman is the president of the Arkansas Colonizing Co. of Little Rock, Ark., with offices in the new building of the Bank of Commerce. She is thoroughly familiar with the largest affairs in the State, and has successfully negotiated many of the largest real estate timber deals and colonization plans ever handled in Arkansas. She has the confidence of the railroads, the leading financial institutions and the business public in a general, broad way. Her

integrity and business acumen have won for her a complete and deserved success, and largely through her efforts the Arkansas Colonizing Co. has attained the high rank it holds as a leading land and colonizing company in Arkansas and the Southwest.

As evidence of her diversified activities, she has completed arrangements for building a standard-gauge railroad of considerable length to develop properties that she saw had been lying dormant many years, but which needed transportation facilities in order to bring them to the front. The difficulties presented by such an undertaking were of a nature to call for the best in men experienced in such work, but she overcame all obstacles.

The Arkansas Colonizing Co. has large properties of its own, one of these being a few miles north of Camden, Ark., on the St. Louis & Iron Mountain Railway. The battle of Poison Springs was fought on this track. From a white oak tree cut down on this property recently there was taken a bucket of lead from bullets shot into the tree while that battle raged.

This company has the confidence of the owners of cut-over timber lands in Arkansas, and from a number holds the exclusive contracts for the sale of their properties. These lands are being sold to men of large means, large insurance companies, to British syndicates and other investors in Southern properties.

Arkansas lands are now sought after more than ever before in the State's history. The Arkansas Colonizing Co. is well prepared by virtue of its wide range of experience and intimate relations with Arkansas people and conditions to give sound advice concerning lands in the State and to direct investors to opportunities to secure properties that are desirable or suitable for special developments of various kinds.

The company has a large clientele of financiers and investors. Its business has been built up by reliability and a reputation for absolute honesty in all things, large and small. It handles big deals; it does things in a big way. The president of this company has been known to spend as many as eleven months in the woods of Arkansas getting her knowledge and information at first hand. The other members of the company are thoroughly acquainted with every nook and corner in the State.

On one of the company's properties, in what is known as the Ouachita or Camden field, is a tract of 2400 acres containing a large deposit of lignite. Dr. George W. Kimball, a metallurgist of Chicago, now located at Camden, Ark., after nine years of experimental work pronounced this lignite to be of the finest grade. It is said to be different from any other lignite ever discovered, and from it Dr. Kimball has obtained 127 different by-products. When this lignite comes from the ground it resembles ordinary soft coal, except that it is more oily and slightly softer. It is suitable for domestic uses, but far too valuable for such purposes. A quantity of this lignite is placed in a retort. At about 180 degrees Fahr. a colorless water begins to flow from the coal. It averages 100 gallons per ton of lignite. At about 250 to 300 degrees a dense yellow vapor arises. Part of this vapor is condensed into oil, yielding 20 gallons from a ton of coal; the remainder forms a colorless and odorless gas. When the refining process is completed about 900 pounds of pure carbon is left in the retort. Of the 127 by-products obtained, not one is wasted or lost. The water contains some tanning matter that greatly facilitates the tanning of hides. The gas obtained burns with a bright flame and is of a better illuminating brilliancy than gas made from any other coal. The oil is used in the manufacture of many medicinal products, and in making paints, and a most excellent soap is made from the residue. The residual carbon is used for making a waterproof structural iron paint, and for three years has been used by the elevated street railways of Chicago, and is pronounced by them to be a perfect structural iron paint. The oil is used often and successfully in the treatment of hay fever and asthma. The oil has been analyzed and found to contain about 1 per cent. creosote and ammonia. The remaining 99 per cent. is not composed of any material now known to chemists, and has been named "Ark-Oil," in honor of the State where it was first found. The manufacturing concerns that buy this oil work it into more than 100 different medicinal preparations. It is also used as a disinfectant.

The most valuable of all uses to which this oil is put, perhaps, is as a preservative of wood. It rapidly permeates all woods and prevents decay for many years after treatment. In the manufacture of the various products there is absolutely no waste; every pound of lignite put into the retort is accounted for by some finished product.

The gas can be made in quantities at a cost of only six cents per 1000 cubic feet, and no very intricate appliances are needed for manufacturing this gas. There is so much of this coal in Ouachita county alone that gas enough to supply the whole State of Arkansas could be made for a hundred years without appreciably diminishing the supply. A fire clay bed of excellent quality lies eight feet thick above and fifteen feet thick below the coal deposit, running approximately 20,000 tons to the acre. Its excellent quality is put beyond doubt by a most exhaustive chemical analysis and by furnace tests, made by experienced clay manufacturers.

Capital interested in developing these and similar properties in Arkansas, whether it be capital in Europe, Canada or the United States, is invited to correspond with the Arkansas Colonizing Co., Little Rock, Ark.

# Dunbar, West Virginia, Model Site For Various Industrial Enterprises

## New Town in Kanawha Valley That Presents Inviting Opportunities for Manufacturing Plants



**D**ESIGNED, planned and plotted for a model manufacturing town, Dunbar, lying on the Great Kanawha River, six miles downstream from Charleston, W. Va., presents attractions as unique and inviting as can be encountered elsewhere in the country. Possibly its story is told better in the words of Col. Fred Paul Grosscup, originator and manager of the company owning it, than in any other way.

"The foundation of Dunbar," said Colonel Grosscup, "was the physical expression of a desire that has obsessed me for a good many years—that of building a manufacturing suburb that would offer to factory owner and artisan conditions of operation and employment combining the best opportunities for profitable business with the best possible living conditions. In building a town of the highest class from the workingman's viewpoint, there are five essentials—a good rich garden spot for the home, pure water, steady and lucrative employment, proper amusements and cheap transportation to and from city shops and markets.

These essentials are all provided at Dunbar. In securing the site I chose one that had been a market garden, and the soil of which, naturally fertile, had been greatly enriched by the application of natural fertilizers for a number of years. Then I had the lots laid off of sufficient size to give each householder enough ground for a garden in which he can raise all the vegetables his family can consume.

"An abundance of pure freestone water is secured by sinking wells, and this will be pumped into a reservoir located sufficiently high above the town to give the necessary gravity pressure for fire as well as domestic purposes.

"There are already established at Dunbar a number of industrial plants to furnish employment to many people, and other plants will be located as rapidly as possible.

"We are building an amusement park, which will have many attractions during the summer months. We have an artificial lake for boating, and a good race track upon which a matinee driving association gives interesting races during the season.

"The traction line already built to the lower end of Charleston is being rapidly constructed to the center of the city, and will soon be running its cars through the streets. When this line is finished Dunbar will be but 25 minutes from the Charleston postoffice. The fare will be five cents, and the citizen of Dunbar can have the advantages of Charleston's churches, shops and theaters on equal terms, so far as cost is concerned, with the Charleston citizen who lives half a dozen blocks from the business center of the city.

"We believe these advantages will bring to Dunbar laborers of the very best class, a most attractive possession for any community that wishes to secure manufacturing enterprises.

"For the manufacturer Dunbar has many inviting features. First among these, perhaps, stands the abundant supply of high-grade fuel at low cost. The Dunbar Land Co., which owns the Dunbar townsite, has a subsidiary company known as the Charleston-Dunbar Natural Gas Co., a corporation organized for the purpose of bringing natural gas into Dunbar and selling it there at a price that will prove attractive to manufacturers. This gas company now has three lines into the town, from as many different gas fields, each independent of the others, and with an aggregate supply that promises to last for many years. The gas company, being controlled by the same people who make up the land company, and whose chief interest lies in building up their industrial town, guarantees the low price of this most desirable fuel, and the man who establishes his manufacturing plant at Dunbar is thus saved from the danger of greatly advanced prices. Those who find other fuel preferable to gas can be accommodated at Dunbar, for the best steam and coking coals of the country are within easy reach by rail and water, and can be laid down at Dunbar at the lowest possible cost for freight. The fuel factor of the manufacturing equation is solved at Dunbar for all time.

"In the matter of transportation Dunbar is well provided for. It is situated on the Great Kanawha River, a stream that has been locked and dammed by the Government, making it navigable for boats of considerable size throughout the entire year. With the creation of a nine-foot stage in the Ohio, from Pittsburgh to Cairo, an undertaking upon which the Government is now engaged, and which will be pushed to completion as rapidly as possible, there will be perpetual water transportation from Dunbar to the mouth of the Mississippi, and thence to all the world's ports.

"In addition to transportation by water, Dunbar has the advantages coming from three railway lines. The Kanawha & Michigan Railroad runs through the town, and the Chesapeake & Ohio and Coal & Coke connect with it at Charleston. By arrangement with these roads Dunbar takes the Charleston rate on all, without switching charges, and a car loaded at the factory platform in Dunbar goes to any point on either line, or to any connection of either line, at the same price it would pay had it been loaded into a car lying on a siding of either line in the city of Charleston. The Kanawha & Michigan runs into Ohio and there connects with the Toledo & Ohio Central and many other roads leading into the various centers of business in the West. The Chesapeake & Ohio carries to ocean terminals on Hampton Roads, and to

Cincinnati, Louisville and over connecting lines into all the cities of the middle and farther West. The Coal & Coke runs northeast and connects with the Baltimore & Ohio and the Western Maryland, and through them with a network of roads to the East.

"For local passenger transportation the Charleston-Dunbar Traction Co., also a subsidiary of the land company, has built an electric line to the city limits of Charleston, and is now engaged in building it through the streets to the center of the business district. This is a road of first-class construction, laid with 70-pound steel rail, and equipped with cars of the best type. In fact, it is, in construction and equipment, an electric line of the highest class. Built to help serve the ends for which the town of Dunbar was founded, that of making a model manufacturing suburb, the fare on this road between Dunbar and Charleston will be kept at five cents. This will give the Dunbar manufacturer the benefit of the Charleston labor market, for with a five-cent fare and a 25-minute service workmen having their homes in that city can cheaply and conveniently go to their work in Dunbar, just as those who make their homes in Dunbar can find their employment in Charleston if they so desire.

"For raw materials the Dunbar manufacturer has many sources from which to draw. All about are glass sands, some of them of the highest quality known to the country, and these latter especially within easy reach by direct rail route. The first glass made in the Great Kanawha Valley was produced less than half a dozen years ago, and now there are glass plants in a number of different places, including Dunbar, and the outlook is bright for many more within a very short time. In fact, there are well-posted people who express the belief that the Great Kanawha Valley will become, within a few years, the greatest glass-making section of the entire country.

"The fame of West Virginia's hardwoods is co-extensive with the country's boundaries. The poplar, the oak, the maple, the chestnut and various others are of the very highest quality and are much sought after by woodworkers everywhere. Dunbar lies well within the zone of the timber production, and with its numerous advantages of physical position is the logical location for furniture factories and woodworking plants of many other kinds. Millions of feet of timber can be brought to its saws by water, while other millions can come cheaply by rail from nearby forests, and there is no spot anywhere upon which it can be more economically made into its various finished products, or more easily or economically distributed throughout the country's largest centers of population and commerce.

"Iron and steel can come to Dunbar from the Pittsburgh district direct by water, and therefore the location is an excellent one for the manufacture of steel and metal products of various kinds. Shales and clays of high quality lie about on every hand, and the opportunities are good for making brick, tile and other things of like nature. In fact, there is hardly any article in the manufacture of which fuel plays an important part which cannot be economically produced at Dunbar.

"In laying off this industrial town the company carefully preserved the sites that were thought to serve best as the locations for manufacturing plants, and these will be found, I think, especially eligible, in respect of convenience to wharves and railroad sidings. The residence lots are of sufficient area to provide a good-sized garden with each home, the water is abundant and of the best quality, the streets are wide and straight and well-graded. A good many houses have already been built, and the company will begin the construction of 100 more at an early date. These houses will be well built and will contain all the conveniences of modern city homes. They will not be expensive, but they will be comfortable. Just the kind, in short, that should appeal to the artisan and wage-worker of the better class, and for such they are intended.

"There are now in operation at Dunbar a number of manufacturing plants, more will be located there with the opening up of spring, and I believe another year will see a very considerable increase in its industrial concerns. We will be glad to hear from anybody with reference to the location of such plants, and will do all we can to encourage the location of such as are well-founded and worthy, for we believe if they can be operated at a profit anywhere they will be successful at Dunbar."

Such is the story of this new industrial suburb as simply told by the man who planned and founded it, and whose chief ambition is to see it become the model of its kind. Colonel Grosscup and those who are with him in this enterprise have aided in many ways in the growth and progress of Charleston and the valley of the Great Kanawha, and have been the active and aggressive force in some of the leading developments of the city and section, but in no other have they embarked upon an enterprise that promised so much along lines of substantial industrial development as in their Dunbar undertaking. Backed by ample capital and directed by the highest intelligence, the Dunbar Land Co. and its two subsidiaries, the gas and traction companies, should, and doubtless will, make of Dunbar what Colonel Grosscup and his associates have intended it should be—the model industrial town in one of the greatest industrial States in the South.



## Typical Crops on Louisiana Reclaimed Lands



CORN IN JULY ON RECLAMATION LAND, NEAR NEW ORLEANS, TYPICAL OF ALMOST LIMITLESS POSSIBILITIES.



GATHERING LATE CROP OF IRISH POTATOES, CORN HAVING BEEN PLANTED BETWEEN POTATO ROWS. PHOTOGRAPH TAKEN IN JULY.

# Reclamation Potentialities of Louisiana

## A National Asset Worth Billions

### THE RICHEST LANDS KNOWN TO MAN NOW BEING UTILIZED—GREAT DRAINAGE AND SETTLEMENT OPERATIONS



N the so-called swamp lands of the South there is a potentially richer asset of this nation than all of the gold and all of the timber the United States has ever contained.

The gold, always an inferior product compared with the one item of cotton production in the South, does not reproduce; a merchantable tree requires from the thirty years of a loblolly pine to the thousand or more of a cypress to attain its growth, while every acre of Southern swamp lands can be made to produce from one to four crops, worth from \$15 to \$500 an acre or more, every year, to the end of time.

The alluvial wet lands of the Louisiana delta, some five million acres in extent, lead all the other so-called swamp lands in richness and fertility and are susceptible of the production of hundreds of millions of dollars' worth of foodstuffs every year.

The country is just now beginning to wake up to the significance and importance this situation contains.

Only seven years ago it was difficult to find any number of people, even in New Orleans, who believed the wet lands of Louisiana were susceptible of successful drainage at all, while outsiders turned deaf ears to the arguments in their behalf. Now only the obstinate refuse to recognize the tremendous possibilities for agriculture in these same lands, while outside capital by the millions is actually employed in the work of drainage and pumping that is transforming thousands of acres every year into farm lands of fertility unsurpassed on the globe.

Twenty-five companies are at work around New Orleans with ownerships of half a million acres; between thirty and fifty dredges—the number being added to all the time—are at work cutting canals and ditches; fifteen thousand acres have been made ready for the plow, and more than 150,000 additional acres are involved in the plans of companies in the field.

The movement is on, and with accelerating speed it is now proceeding to the inevitable goal of the utilization of every acre of this most marvelously rich soil for the cultivation of corn, cane, truck, vegetables, oranges and livestock as well, until South Louisiana shall have become the most densely populated and most prosperous region of the globe.

Exhaustive laboratory tests have revealed the phenomenal richness of the soil. It contains enough nitrogen to raise a thousand crops of corn, 75 bushels to an acre. Every variety of garden truck and vegetables can be raised bountifully and early. California fruit growers are enthusiastic over the possibilities of vastly extending the long established orange and grapefruit industry here, there being no finer specimens grown than the Louisiana sweets in oranges and the varieties of grapefruit raised.

With a soil hundreds and thousands of feet in thickness; with river, rail and ocean transportation at the door, and with additional shipping facilities provided by the deep and wide canals drainage requirements will create; with the close proximity to all the great market centers of the country, thousands of miles nearer than the Pacific coast orchards and farms; with the chief city of the South as the central shipping point; with a climate of statistically demonstrated great healthfulness and conspicuous salubrity, the bugbear of unhealthfulness having been entirely eliminated by science and drainage, the foundation for a vast development exists here as in no other section of this or any other country.

A recognition of this fact by the world at large seems imminent now. South Louisiana at last appears to be coming into its own!

Misunderstandings as to the nature of the alluvial wet lands' character and formation and the methods of their so-called reclamation are being cleared away.

Except in the cases of infrequent crevasses or breaks in the Mississippi River system of levees—and protection under national auspices, until this danger shall have been as certainly eliminated as in the case of vastly more difficultly dyked Holland, will inevitably be provided—there are no overflowed lands in the lower Mississippi delta. The swamp lands here are simply level stretches of silt and humus on which rain water falls, accumulates and saturates, without opportunities for sufficient drainage in the natural state. The levees of the river shut out any original drainage that occurred, for no streams flow into the Mississippi for hundreds of miles above the mouth.

The water in the rivers, bayous and streams must thus find an outlet into the Gulf of Mexico through channels other than the Mississippi.

Drainage operations therefore consist in digging canals, reservoirs and ditches with sufficient depth to draw all the surface water off, when, with adequate pumping plants and levees of proper height and strength thrown around a district to be drained, the water can be lowered to six feet or more below the surface by being pumped into lakes and streams that have their outlets in the Mexican Gulf. Thoroughly drained tracts are thus right now placed in identically the same position as is New Orleans. Before the installation of the present admirably complete drainage system water was found within a few inches of the surface anywhere. Then a pumping process was necessary as a preliminary in the construction of any city building. Now dry earth is found in any excavation to a depth of six or more feet, and cellars and basements are frequent instead of being wholly unknown, as was the case within very recent years.

One retarding feature in the wholesale drainage of Louisiana's wet lands was the lack of statutory provision for drainage bonds to secure funds for

the cost of the work, ranging from \$15 to \$35 an acre, in accordance with the heaviness of the work to be undertaken.

The State Legislature in 1910 passed a law enabling owners to form drainage districts and issue bonds, under the direct supervision and responsibility of the State Board of Engineers, the proceeds to be devoted solely to drainage purposes, and to be paid for when issued by a fund collected as a tax by the State running throughout a long term of years on the lands in the district affected. The proceeds of the bonds when sold are available as needed to pay for drainage work. The tax is in the nature of a first lien on the property, and its levy and collection are made the imperative duty of the drainage board and tax collector. The lands must be sold for taxes if not paid each year, though only one year's taxes are payable at one time, the whole amount covered by the issue not becoming due in case of default as in a mortgage. No court proceedings are necessary, the property being simply advertised for sale for taxes, the cost for which would not exceed from \$5 to \$7 in the case of any single transaction.

In operation it is unconceivable that any difficulty would occur in securing the \$2 an acre or so which would represent the amount of any one year's taxes—for any land included in a drainage district would be worth many times more than the entire taxes of any one year.

The constitutionality and validity of the law have been affirmed by the Supreme Court, and the bonds are declared to be remarkably well safeguarded and secured. Although not generally understood by bond buyers as yet, several issues have been marketed at favorable terms, and it is predicted that within a few years no bonds on the market will find a more ready sale than the Louisiana reclamation bond.

It is recalled that in the early years of the Louisiana levee bond it was not in popular demand, whereas now it sells readily at 118 or so, and the prediction is made that the reclamation bond will have a similar history, to the vast advantage of the bond houses and purchasers who early take hold of these securities.

An interesting and illustrative review of the drainage proposition in Louisiana is furnished by John A. Kruse, an eminent engineer and drainage expert, with offices in Chicago and New Orleans, who is in charge of a number of the most important enterprises in Louisiana. He has had a wide experience in this country and in other countries of the globe, and is thus qualified to give an expert opinion. Mr. Kruse's statement of the case is given here-with:

"The reclamation by drainage of the 75,000,000 acres of so-called swamp land of the United States is the most important question to the people of this country that has been brought to their consideration since the Civil War. Its importance to all the people of this great country and the magnitude and scope of its results are so vast and far-reaching that it dwarfs into comparative insignificance even the work of digging the great Panama Canal. The reclamation of this, the best land on the continent, will bring into bearing an area of land which will have a producing capacity sufficient to support a population almost, if not quite, equal to that of this country today; an area of land with a producing capacity (measured in dollars and cents) which will range from three and one-half to four billion dollars per year; an area of land which will provide homes for millions of people, and food and clothing for still more millions. Of this area of the most fertile land there is a particular portion which may be called the 'Best of the Best.'

"It consists of about five millions of acres of land which, in the language of an eminent engineer of wide experience in the Government reclamation service, 'is unequalled.' There is no other like area known to the white race which will support so dense a population. This great area of the most fertile lands the world has ever known, or probably will ever know, is called the Lower Delta of the Mississippi, the wet and overflowed lands of Southern Louisiana. This statement is borne out by logic of the situation, because his great area is made up of the cream of the top soil of the richest lands of 26 of the richest States of the Union, which soil has been carried down by the mighty Father of Waters, the great Mississippi River, and deposited on the floors of the Gulf of Mexico, forming a soil averaging from 1000 to 3000 feet in depth and comprising the area mentioned.

"Not only are the reclaimed lands the richest and most fertile of any in the locality in which they are situated, in whatever community, county or State, but they have proven to be the richest lands of all the countries of the globe. Two-fifths of the entire kingdom of Holland is drained land, and a great portion of it was recovered from the sea, and this great area became, and is, the most fertile part of the lands of Holland. Owing to the production of these lands, Holland developed two great seaports, Antwerp, the third export city of the world, and Rotterdam, the fifth. The reclaimed lands of Belgium, Denmark and portions of Germany are the most fertile of those countries.

"Reclamation in Holland at the time it was undertaken was a stupendous problem, because they had to fight back that great enemy, the enemy of the floods from the rivers, as well as to resist the invasion of that greater foreign enemy, the sea, which is restrained by the raising of big levees around the land to be reclaimed, of sufficient height and size to hold out a daily tide of 31 feet maximum. The base of these levees is 250 feet wide and they are from 42 to 60 feet high. The cost was very great, but notwithstanding that the work was undertaken by the government, and through it Holland was



made a great kingdom. Thirty-eight per cent. of the cultivated lands of the kingdom are below the level of the sea at high tide.

"England has had its reclamation of its swamp lands and fens. England was beginning to realize that with her increasing population the available area of productive land would not support them, and she turned to her fens or swamp lands for relief as the means to feed her people, and she found that by reclaiming these lands she had brought into productiveness such a rich territory as to enable her to reach out and establish colonies in all parts of the world.

"In the eighth century nearly 6 per cent. of the total present cultivated area of the continent of Europe was known as unreclaimable morasses, and since the same has been reclaimed that land is supporting upwards of 35 per cent. of the population of that continent. Twenty per cent., or one-fifth of the entire present cultivated area of England and Ireland, was marsh or swamp lands in the days of the Saxon kings.

"These reclaimed lands of Europe have a market value today of from \$1000 to \$3000 per acre.

"We see what has been done in the foreign countries. Reclamation was accomplished at an immense cost in those days, because none of the present modern dredging machinery was known, and yet it has paid for itself thousands of times over and has enriched not only the countries in which the lands are located, but also the population of those countries. And today those reclaimed lands are the backbone of many of the great nations of Europe.

"The swamp or wet lands included in the list of reclaimable lands in Government reports, all of it, every acre, in every section, as judged by what has been accomplished in Illinois, Iowa, Missouri, Louisiana and other States in this country, is as rich, if not richer, than any of these European lands. The results have shown that the reclaimed swamp lands are the richest lands in every State and in every country in the world. But the richest and most fertile of all these wet lands, the richest of all the swamp lands in the world, the richest large area of land of any kind that is known to the human race the world over today, is that great tract of alluvial land in the lower delta of the Mississippi River within the borders of the State of Louisiana.

"All swamp lands are formed, as is well known, by the depositing of soil that is washed down from the slopes of the surrounding watersheds into the valleys by the streams of the country. At the same delta of the Mississippi, in Louisiana, there is the most fertile land of the world, because it represents and is built up from the richest soil of the greatest drainage basin on earth; in fact, it is the cream of the top soil of twenty-six of the richest States in the United States, and is therefore the most fertile soil known. These twenty-six States included in the drainage area of the Mississippi River have for centuries been giving up the cream of their top soil to make up the delta of the Mississippi River. Ohio, Kentucky, Indiana, Illinois, as far east as Pennsylvania, Minnesota and the Dakotas on the north, Missouri, Kansas, Iowa and clear into Montana, all have contributed to the results, and all the soil so given has come from the top soil of the best farms that exist there, carried by the rains into the streams, thence into the great river, to make the finest mixture that is possible for a chemist to compose from all the elements of all of the soils of the world carried down and deposited on the floors of the Gulf of Mexico, forming that great region. This work is still going on and will not stop while the great forces of nature continue, and that great robber, the Mississippi River, is still taking away the soil from our farms with every rainfall, carrying it down into the rills, thence into the rivulets and streams on into the mighty Father of Waters, to be by him carried down where it has built up that great area of the most fertile land known to man.

"Experiments have shown a depth, all over the delta, of an average of upwards of 1000 feet, and at one point where a depth of over 3100 feet was reached, this being the deepest boring being made in the section, the drill was still in the soil when the drilling ceased. That soil is not only the cream of all these different farms, but all of the cream of these richest farming States has been amalgamated, mixed together and deposited there, and it has had for centuries a wonderful growth of vegetation which produces the organic matter commonly known as humus. And in such a genial climate—in a place where the hours of sunshine are so many every year, with the many more hours' growing time than in the States from which the soil was taken! This top soil or humus silt, in itself, would be worth a large amount of money transported back to the farms from which it came, if used as commercial fertilizers are used today.

"The same necessity that forced the reclamation of the low lands of Holland and the fens of England is forcing the reclamation of our swamp area. Within the last decade the attention of the capitalist and the farmer has turned to the great alluvial deposit of the lower delta. The wonderful richness of its soil, its healthful climatic conditions, its adaptability to the growing of the greatest variety of crops, its long-growing period, its nearness to market, have all combined to bring this area into public attention. The work of reclaiming the lower delta country is well under way, and is being pushed with great vigor. The reclaimed lands are being eagerly bought by the thrifty farmer from the North, and he finds in their wonderful soil and salubrious climate a veritable mine of wealth.

"When it all is drained, as it can and will be unquestionably within a very few years, it will have the capacity of producing one billion dollars per annum, or more than twice the total gold production of the world, and this production can be maintained, not for one year, not for ten years, but for all time.

"It will have the capacity of producing each year a sum sufficient to pay all the present expenses of running this great Government. These fertile acres in the delta region, when reclaimed, will provide homes for millions of people. On the basis of population of Holland they would take care of and furnish homes for 7,500,000 of population. On the basis of the population of the reclaimed lands of England, including the cities and towns, and with New

Orleans as the great center, they would have the capacity of sustaining a population of upwards of fifteen millions. Based upon the productive capacity of portions of this area already occupied, that is, the lands tilled by the Acadians, the people romantically described by the poet Longfellow in his 'Evangeline,' who are now living along the Bayou La Fourche, Teche and others, they would have a capacity of providing homes for upwards of six millions of people. President Roosevelt, in his annual message to Congress December 4, 1907, said:

"As an incident to creating the deep waterway down the Mississippi, the territory lying adjacent to the Mississippi along its lower course will therefore become one of the most prosperous and populous, as it is already one of the most fertile farming regions in the world."

"The prediction contained in President Roosevelt's statement is based on the fact of the great and enduring fertility of this region, a fertility equal to, if not exceeding, any other equal area in the world.

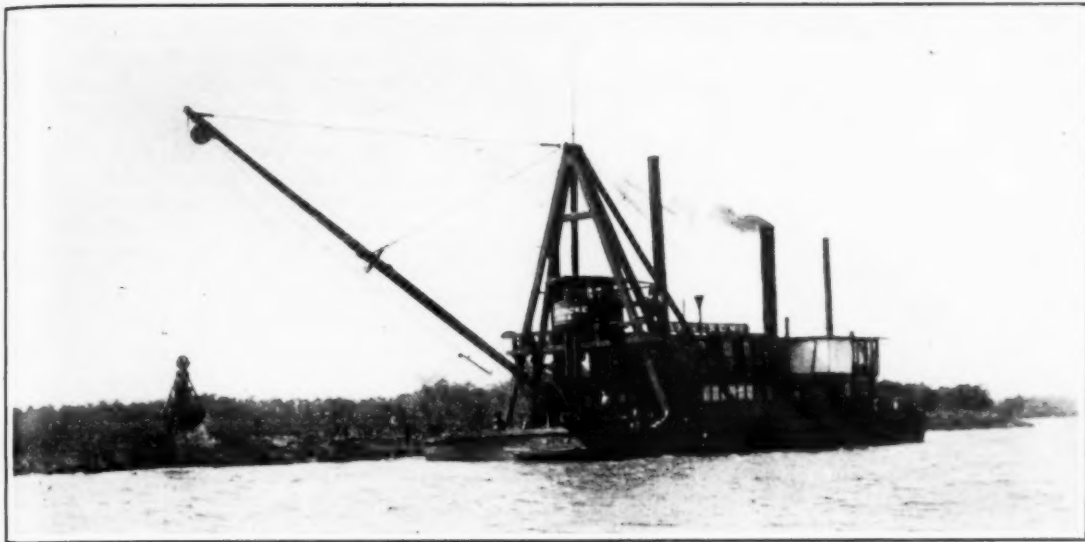
"This great area of the most fertile land of the world has been so fortunately placed by nature that it possesses every advantage that the cultivator of the soil may desire in an equable and healthful climate, where the hours of sunshine per day, month or year are greater than in any of the farming sections from whence the land was taken; with a well-distributed rainfall; at the doors of the great bulk of our population, surrounding one of the great cities of the world, thereby insuring markets for the products at all times, this area, when reclaimed and occupied by an intelligent agricultural class, will not only be one of the most productive, healthful and beautiful districts in the world, but is bound to become the mecca of the tourist, the sanitarium of the invalid and the winter playground of the people of this continent. It is doubly important at this time and in this city, because it means that the predictions made by Thomas Jefferson, at the time of the Louisiana Purchase, are about to be fulfilled, because it means that New Orleans is going to become, as he said, one of the great world cities. It is important because this city, now one of the great seaports of the world, is to become a densely populated city with a surrounding prosperous agricultural population of from five to fifteen millions of people within a radius of 100 miles. It is important at this time because the great vast area of free and cheap lands which the Government heretofore possessed has been exhausted; because with no further virgin soil to be placed in cultivation except these unreclaimed areas, our population is increasing at such an accelerated rate that fear is expressed in economic circles that we may become importers of foodstuffs instead of a nation made great by the exportation of these products, and it has been stated that our population will be doubled by the year 1940. We have read the statement made by the President of these United States in his speeches, that the lands susceptible to cultivation were exhausted, and that we must look to better and more intensified cultivation of the present areas if we wish to avoid becoming a food-importing nation.

"The statistics show that in the last decade the area in cultivated land increased but  $4\frac{1}{2}$  per cent., while the population increased nearly 22 per cent. at the same time. When it is taken into consideration, further, that this Government is now spending \$15,000,000 a year in teaching methods of more intensified farming that we may increase the production per acre to such a point as will take care of our increasing population, it being impossible to further increase the area of land capable of cultivation, these considerations make the subject of drainage reclamation one of the utmost importance to the people of this city and State; in fact, to all of the people of this great nation.

"As related to the reclamation of these lower delta lands the engineering problems seem simple, and it is indeed simple as compared with many of the engineering problems which have been solved by engineers throughout the world. Simple and cheap as compared with the reclamation of the lands of Holland, Belgium, Germany or England. But its very simplicity may be a source of great danger for the reason that, simple as it looks, and is, it presents many problems which must be solved. Each reclamation project presents difficulties and problems of its own, and while the entire question of drainage is founded on great underlying principles, the conditions are so different and vary so much as between the different and various sections of the country, as well as the different projects in the same sections, that each one requires the careful consideration of the drainage engineer.

"Even with all the data that can be collected there is still the liability of error in drainage engineering on account of the lack of constants and the different conditions in different districts. Mistakes have heretofore been made in this respect by eminent engineers, one of the most notable instances being that of the drainage of the fens of England. When the work was really begun by King Charles I there was great opposition to it, and the most noted engineer of Holland, Cornelius Vermuyden, was employed to make the plans and take charge of the work. The plans were made by him and were based upon conditions with which he had dealt all his life in the reclamation work in Holland, and they were not at all suited to the conditions existing in England. As a consequence the estimates of costs were found to be too low, and the Government of England had to come to the rescue of the project of guaranteeing the bonds three different times after the necessary changes and alterations of the plans of this great engineer had been made.

"There are none of these difficult problems to be encountered in the reclamation of these most fertile Louisiana lands; in fact, it is not reclamation, as the mean level of the land is above the high tide level of the Gulf. It is therefore simply a drainage proposition. The land being so nearly level, and having such a luxuriant growth of vegetation, the heavy rainfall cannot run off without artificial channels to carry it away; therefore, the accepted or standard plan is to enclose the unit or tract to be reclaimed within a levee or dyke, to prevent an overflow from the occasional severe storms of the Gulf or a crevasse in the levee of the Mississippi. The building of the levee gives the land the advantage or benefit of a navigable canal all around the enclosed unit, which canal connects with all the great waterways of the State. The drainage is accomplished by a system of reservoir canals, laterals and



DIPPER DREDGE DIGGING DRAINAGE CANAL.

field ditches, all connected together to a main reservoir canal on which is placed a pumping plant to remove the excess rainfall from within the levees to the outside or navigable waters connecting with the Gulf. Both reservoir system and pumping plant should be designed of sufficient capacity to take care of the runoff from the heaviest rainfall before injury can result to crops growing on such land.

"So far the work that has been accomplished has been done largely by private capital and private enterprises. The Louisiana Legislature at its last session passed a most excellent drainage law providing for the organization of drainage districts and the issuing of long-time bonds to provide funds to carry out the work. This will, in the future, be a great aid in developing this country. A bill is before Congress at the present time providing for Federal aid. The drainage of four million acres of uninhabited swamp area is a herculean task, and because of its great importance, if there is a way that the Government can render aid in this work, it should be done. If it could spend hundreds of millions in the reclamation of a desert, why should it not aid in draining and making fit for habitation this, the richest body of agricultural land in the world? This area has a greater supporting capacity than any other equal area occupied by the white race. The popula-

States, and it will thus be seen that with the excellent transportation facilities that exist the market conditions will always be the best. And,



A FINISHED CANAL CUT PREPARATORY TO DRAINING LANDS OF THE DELTA LANDS CO. PARADIS.

again, the city of New Orleans, with a population of 350,000 inhabitants, is already the second port of entry in the United States, and its important export trade is increasing with notable rapidity. The opening of the Panama Canal is not only going to add materially to this foreign trade, but is going to exert a wonderful influence on the development of the city and the surrounding country.

"In 1804 President Thomas Jefferson said that New Orleans was destined to become one of the largest cities of the world. It surely occupies the geographical position to become a great and prosperous city. The development of the contiguous swamp area will add immensely to its development and prosperity. There are in the lower delta upwards of 5500 square miles of reclaimable lands, lands that will within a reasonable time be reclaimed. On the basis of the present population in the La Fourche country, this area will have a population of more than 2,000,000 prosperous, thrifty people, and on the basis of the population of Holland it will be upwards of 5,000,000, and the product of these lands annually will be of greater value than the total output of gold in California since its discovery at Sutter's Mill in '49."

As indicating the plans and scope of operation of some of the companies



THIRD STAGE IN THE PROGRESS OF RECLAMATION WORK.

Town building where water meets the rail at Paradis. Navigable canal gives water transportation to New Orleans, while main line of Southern Pacific is on the left.



engaged in drainage work, a somewhat detailed description is herewith given of typical enterprises under way in Southern Louisiana.

#### EDWARD WISNER AND LOUISIANA MEADOWS CO.

Edward Wisner, universally acclaimed as the Father of Drainage in Louisiana, with an ownership of wet lands running into millions in value, has had the usual experience of the pioneer in any field, in that for years he stood alone the almost solitary champion of a cause in which he believed. A banker in Michigan, he came south for his health, which he found. From Northern Louisiana he removed to New Orleans, and with the then firm of Wisner & Dresser began the purchase of so-called swamp lands in 1900. Of such little value were any of these lands then regarded that he was able to



BUILDING SHELL ROADS.

The shells are barged in from the sea and make roads that are second to none in the United States.

secure thousands of acres from levee boards, in whom title had been vested by the United States Government in the fifties at 12½ cents an acre. Nobody wanted the lands at any price at that time, and sales were considered well made by the State at 12½ cents an acre. After subsequent purchases at 25 cents, the members of the board began to feel that Wisner ought to be restrained by a legal guardian from squandering his means.

Still keeping up his purchases, the authorities became finally convinced that he must have some definite purpose in mind and concluded that the State would do well to refuse further dealings with him, and they declined to ratify any more sales in which his name appeared as intending purchaser. In the aggregate, his holdings amounted at the maximum period to 1,300,000 acres.

Wisner from the first foresaw the possibilities of drainage, but it was not till 1906 that steps were first taken for artificial drainage through canals, reservoirs, ditches and pumping plants.

Lands along the ridges, requiring only gravity drainage, were sold from time to time, and the proceeds used to ditch, levee and drain the first unit of 1000 acres on the Raceland prairies.

A second unit of 1000 acres was likewise drained and settlers were induced to locate.

At that time there was no precedent for guidance. There had been some reclamation of swamp lands, but only of wet lands adjacent to "front land" ownership. Nobody had gone onto the "trembling prairies" to drain and prepare them for the plow, and skepticism was rampant. There were no engineers who felt qualified to point the way—none who knew more of the problem than did Wisner himself.

Prospective purchasers asked who had lived on these reclaimed swamp lands, and finding that it was an untried experiment, it was possible to secure only those who had nowhere else to go—many of those making the experiment doing so only on the basis of pay for locating and working on the lands.

It was subsequently found that the levees, canals, ditches, reservoirs and pumping plants, which were modeled after those in use by the natives for semi-drained lands, were inadequate for complete drainage, and when a third unit was created advantage was taken of the experience had, and deeper ditches, more capacious canals and reservoirs and more adequate and modern pumping plants were installed. By these means complete drainage was secured and there are farms in this district where the water table has been reduced to six feet below the surface of the ground, as in the city of New Orleans.

Among the venturesome ones who went where no human being had ever lived before, there were some who remained and made good; others went away.

The earlier developments will now be gone over, and with a more adequate drainage system conditions will invite the stable permanent settlers like those who have located and stayed on the later developed tracts.

Today at Raceland there are about sixty white families, mostly from the North, who own their own land, a good part of whom have fully paid for their lands, and all of them as permanently located as are farmers anywhere. Some have made big returns on their crops, and based on calculations in vogue in Illinois and other Northern States, of reaching valuations of lands through the value of crops produced, these lands have an intrinsic worth of \$250 to \$500 an acre today.

The Wisner interests now have about 4500 acres completely drained and under cultivation in the Raceland district, with 15,000 additional in the same locality on which work is being done with the expectation that it will all be ready for cultivation within the next two years.

About the time the third district work was inaugurated an experiment

was made near Lockport of reclaiming a tract of 750 acres from the bottom of a lake—Lake Fields. Together with an old friend, A. V. Smith, also from Michigan, a partnership was formed by Wisner for the development of this property. Smith invested all he had left from a disastrous business experience, \$1800, and Wisner agreed to advance whatever was necessary to complete the work beyond this sum. From first to last \$18,000 was advanced by him. The work began in 1908, was eminently successful from the start, the land becoming friable and ready for the plow almost immediately after the leveeing and drainage, and a sugar plantation was established, the place now being known as "Smithport." Houses, tenements and buildings have been constructed, the place brought to a high state of cultivation and efficiency, and last year a net return of \$20,000 was secured from the crops and stock raised on this 750-acre farm. Smith had had no previous farming experience, being simply a practical man of affairs.

In 1907 the firm of Wisner & Dresser was dissolved, and Wisner took over the ownership of the wet lands the firm had acquired.

Needing an organization to handle projects, A. B. Graves, then in a bank in Michigan, was induced to handle the finances of the concern, and later Allen T. Dusenbury, also of Michigan, an engineer and land title man, was secured to look after outside physical affairs.

The Louisiana Meadows Co. was subsequently formed with Wisner as president, Dusenbury as vice-president and Graves as secretary and treasurer. This company took over all the Wisner holdings. After the manner of Carnegie, the young men were given an incentive to the greatest possible activity by having an interest in the business settled on them. The work they have done has resulted in the greatest possible enhancement in the values of the company's holdings, so that their prospects for also getting into the millionaire class are excellent, and today the company owns lands in the parishes of St. Charles, Lafourche, Terrebonne, Plaquemine, St. Bernard, Jefferson and St. John Baptiste.

In addition to the drained acreages at Raceland and Lockport, the company has 5000 acres on Bayou Barataria, which has all been ditched and prepared for drainage and on which a pumping plant is being installed.

Wisner, Graves and Dusenbury also own a 4000-acre tract on Bayou Des Allemands, which is largely drained and which they will cultivate themselves.

Also a dozen or so of the most important companies operating today in the vicinity of New Orleans, on drainage projects, are working on lands originally included in the Wisner holdings, while the present Wisner ownerships are still the dominating factor in the wet lands situation here.

#### THE WHITE LAKE LAND CO.

One of the best demonstrations of the practicability and value of the so-called reclamation of the marsh lands of Southern Louisiana is found about one hundred and seventy miles west of New Orleans, in Vermilion parish. This is the property of the White Lake Land Co., a Michigan corporation, of which Mr. A. L. Arpin is president, deriving its name from the fact that the 80,000 acres comprising the holdings of the company lie immediately north of the body of water designated on the maps as White Lake.

These eighty thousand acres offer an ideal opportunity for the reclamationist, in that they are a broad, level stretch of almost treeless prairie—so



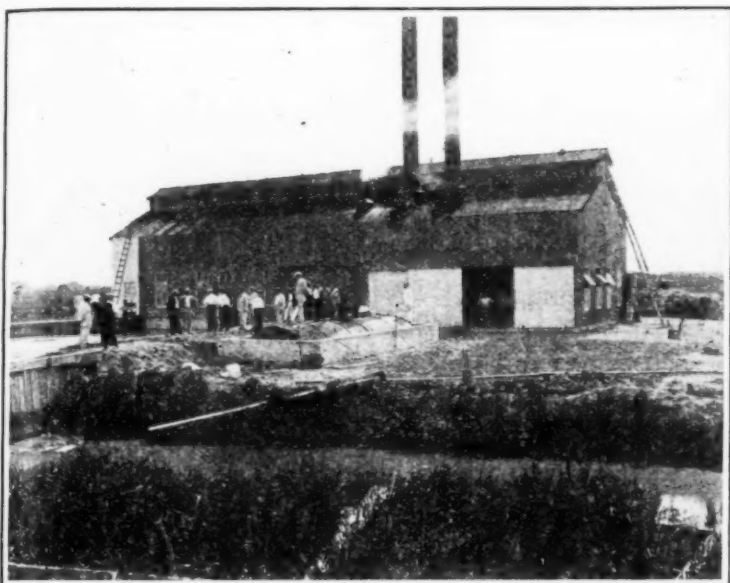
A WELL-BUILT SHELL ROAD IN ST. BERNARD PARISH (COUNTY).

level that the heavy annual rainfall of this vicinity cannot readily make its way to natural outlets; and, because of this, water in varying depth stands for the greater part of the year. Because it is level, on the other hand, and free from stumps, stone, rock or other hindering substance, the work of the big dredge boats is simplified and cheapened as compared with those regions in which such obstructions are encountered. Again, the tract forming an almost perfect parallelogram some twelve miles in width by fourteen miles in length, offers the engineer no problem beyond simple geometric lines; it may be and is, so far as the survey has progressed, laid off with the simplicity of a checker-board.

The White Lake Land Co. began its operations upon this tract something like two years ago, at which time its first unit of 5700 acres was platted, following the organization of a drainage district under the laws of the State by which bonds were issued and a tax levied to provide funds for their repayment. This first unit consists of an almost perfect square, around which has been thrown a levee, thus fortifying the unit against the encroachment of water from without. Inside the levee there was then, by the use of heavy machinery designed for the purpose, established a system of canals and

ditches by which the water is accumulated in the larger of the canals; whence, by the use of centrifugal pumps, it is lifted from the interior to the exterior of the surrounding levees, there to disappear by evaporation or by slow dissipation into water courses leading to White Lake.

Nothing could be simpler than this method of drainage, from an engineering standpoint, and it would seem that even the layman at his first observation would be convinced of its soundness in theory and practice—as, indeed, he usually is. But it is an expensive proposition. It is quite easy to say that a levee has been built, that canals and ditches have been dug, and that pumps have been installed, but the expenditure of time, labor and money upon the undertaking is a thing of no mean proportions. In the first place, the levee surrounds approximately nine sections of 640 acres each, or 5760 acres, in a



STEEL AND CONCRETE PUMPING PLANT ON PROPERTY OF WHITE LAKE LAND CO.

square having four sides each three miles in length—twelve miles or so in all. The levee has an average base of perhaps thirty feet and an average height of between four and five feet. Then there are between twenty-five and thirty miles of canals, ranging in width from twenty-five to fifty feet and in depth from six to ten feet. Again, connecting these canals, is a network of lateral ditches many miles in length. All this means work, and lots of it, and money, and lots of it, and time, and lots of it. In addition to this part of the design came the pumping facilities. Located in the southeast corner of the square as described is the pumping plant. It is said to be the largest plant of this character devoted to drainage in the South. It has a capacity of 220,000 gallons per minute. That is its maximum. It will seldom or never be fully used. In truth, it is only under extraordinary circumstances that the pump will be called upon at all. Under normal conditions the system of ditches and canals takes care of the drainage of this unit of land without the assistance of the pumps to remove the water from within the barricade. Evaporation and absorption and the natural flow ordinarily take care of the water that before the installation of the system was surplus. But there are times when the rainfall in this section reaches as much as eight inches during twenty-four hours. And it is at these times that the pump is necessary. It is an emergency provision. By it, too, in the possible event that rainfall is deficient, the unit, or polder (by which name the square of drained land would be known were it located in Holland, the home of "reclamation," so to speak) could be adequately supplied with moisture—irrigated in the most modern and approved way.

During March of 1912 the system of drainage as here outlined was completed, and the test of its practical operation was made. It had been a general opinion—it must be understood that drainage of large bodies of Southern Louisiana land was still largely a matter of theory rather than practical exemplification—that within thirty days of the starting of the big pumps on this unit the big traction plows and pulverizers of soil could be started and that a first crop of corn could be planted that season. But not many days elapsed before it was well understood that a longer time would be required to remove the moisture from about the grassroots, which served as a sort of sponge, than had been reckoned. Consequently, only a small portion of the land was put to crop during 1912.

In the meantime a demand for the land had been created among the Northern homeseekers, hundreds of whom had accepted the invitation to come upon the ground and make personal inspection and investigation of the proposition. From Indiana, Iowa, Illinois, Missouri, Minnesota, Nebraska—especially Nebraska—came the visitors. A very large proportion of them, immediately impressed with the prodigality of nature in the way of fertile soil, delightful climate and unlimited opportunity, became purchasers of parcels of land, and it was not long before every acre of this first unit of 5700 acres had passed into the ownership of these energetic and ambitious Northerners, the majority of whom contemplated immediate settlement upon the land and its improvement. There has been some unlooked for delay in this respect, as intimated, but today, where less than twenty months ago was a barren, unsightly, unproductive marsh—repellant from every aspect—there has sprung up an active village (Florence), surrounded by new farms upon which nearly one hundred families are working out their destinies.

Even before the first unit of 5700 acres was "reclaimed," the White Lake

Land Co. began operations upon a second unit of 2600 acres adjoining. The same engineering problems were met with, and the same work along the same general lines was put upon this unit, the result being that during the fall of 1912 it, too, was ready for the occupancy of the buyers from the North who had already become its owners. And a third unit of 5000 acres commanded the attention of these energetic reclamationists. This, too, has made considerable progress, and will shortly have passed through the various stages from wet lands to cultivated farms as have the tracts referred to.

This, then, is the present status of the business of the White Lake Land Co. in Vermilion parish: 5700 acres have been drained and are now being cultivated, upon a portion of which crops were grown for the first time in history during 1912 and upon all of which crops will be growing this season; 2600 acres are almost ready for the plow, and the larger portion, if not all of it, will be in cultivation during 1913; 5000 additional acres will have been drained and made ready for the plow by the beginning of the season of 1914. Of this, the greater acreage has already been sold. Indeed, the demand for the land is so far in excess of the supply that eighteen months or two years will be required for the reclamation end of the business to catch up with the selling end.

Finally, the demonstration here may be said to include the practicability, the feasibility of drainage as planned; the possibility of its profitable cultivation (there never has been a question of the fertility of the soil); the possibility of its disposal to Northern farmers and its perfect adaptability to their uses.

The White Lake project is the largest private enterprise of its kind in the South. Its inauguration at a time when the public was more than skeptical upon the subject of drainage as applied to the marshes of Southern Louisiana demanded from its inspirators more than ordinary business nerve and daring, but by adhering closely to its original plans as made by able and successful engineers, while readily adapting itself to emergencies and unlooked-for contingencies as they arose, and the readiness and ability to meet the heavy expenditures of money involved, the project has become of nation-wide fame and is one of the show-places of the State to which the home-seeker from the North quite naturally gravitates when seeking information concerning the wonderful resources of this part of the South, and confirmation therein. Best of all, it stands up handsomely under any test that may be applied, and it is certain that in the time to come, when all the submerged area of the State shall have been drained and made mightily fruitful, the White Lake Land Co. will occupy that enviable position universally and deservedly given the pioneers and leaders at the head of any movement inherently great in the benefits it may confer upon the human family.

#### LOUISIANA DELTA LANDS CO.

A very notable development is that of the Louisiana Delta Lands Co., owner of the Paradis tract. The lands of this company, some 19,000 acres in extent, are in St. Charles parish, beginning about 27 miles from New Orleans and fronting on the main line of the Southern Pacific Railroad. The officers of the company are: J. Lahroy Slusher, president; Julius F. Funk, vice-president and treasurer; Henry L. Favrot, secretary.



INSIDE VIEW OF PUMPING PLANT OF WHITE LAKE LAND CO., SHOWING CENTRIFUGAL TYPE OF PUMP IN GENERAL USE FOR DRAINAGE PLANTS.

Vim and vigor have marked the operations of this company from the beginning. President Slusher is a thorough land man; Mr. Funk is one of the Bloomington, Ill., Funks, who are among the most famous and successful corn growers in the world, and Mr. Favrot is a New Orleans attorney who has specialized on drainage matters, and was, as a member of the State Senate, instrumental in getting through the drainage bond law of 1910, the joint product of himself and Mr. R. E. Milling. Behind that company is ample means, and, with officers in New Orleans and Chicago, a selling force is kept at work that is producing remarkable results. Up to date over 6000 acres of the tract have been sold to Northern farmers in 40, 60 and 80-acre tracts. Twenty-five families were located on the property by Christmas, and 100 families are expected to be located by the first of May. Excursions of prospectors are brought down at



# The Wm. J. Oliver Manufacturing Company

## An Important Factor In Southern Development



AMONG the manufacturing concerns that are here and there achieving distinction in giving the South a broader and more significant development along industrial lines and making known its potentialities throughout this and foreign lands, that of the Wm. J. Oliver Manufacturing Co., at Knoxville, Tenn., occupies a unique place of importance. Its various products are finding their market not only in every section of this country, from the Atlantic to the Pacific, but in other countries as well, from Canada to Brazil, and even to far-off New Zealand.

The plant covers, with its yards and buildings, over forty acres. It is located on the tracks of both the Southern and the Louisville & Nashville railroads. It has shops of various kinds for the manufacture of the numerous kinds of products made by the company and for extensive repair work for contractors, mill men, coal mines and railroads. The principal buildings are the main shops, 572x166 feet; the foundry building, 418x134 feet; the wood-working shop, 280x100 feet; the grinding-room, paint shops, etc., a very large storeroom, pattern-house and spacious office building. The equipment is thoroughly modern, and embraces every kind of machinery needed in handling the various branches of the company's business. It is especially adapted to doing jobs of the larger kind, and some classes of work done here cannot be turned out elsewhere in the South. The machines are all driven by independent electric motors, the current for which is generated at the central power-house. The main building has two 50-ton electrically-driven traveling cranes, the foundry building two of the same character that are capable of handling 20 tons, and the woodworking shop one also of 20-ton capacity. In fact, the plant is built and equipped especially for the rapid and economical handling of work of the larger kind.

The Oliver company is engaged in manufacturing dump cars, railroad flat cars and general contractors' equipment, mine equipment, logging cars, quarry equipment, marble-finishing machinery and plows, and to do, in addition, a general repair work on engines, boilers and all other kinds of contractors' and railroad equipment.

In the matter of dump cars, it makes a specialty of the Oliver Two-Way Air Dump Car, a product that embodies the last word in contracting equipment. The regular sizes in which these cars are made are 12-yard, 16-yard, 20-yard and 30-yard, though other sizes are made to order when preferred.

These sizes are standard-gauge cars, built according to M. C. B. specifications throughout and equipped with government safety appliances. They are moved on their own wheels from place to place. The other standard-size cars manufactured are the 4-yard and 8-yard 36-inch gauge used by contractors and industrial plants. The improved Oliver 4-yard car, which is built with one of the strongest trucks, has been pronounced by a great many of the leading contractors as the best 4-yard car on the market.

The Oliver double-truck 8-yard car, 36-inch gauge, has also proven itself to the contractors to be far superior to any other car built where they have long hauls. Other sizes and types of cars are also built as ordered.

The 12-yard and 20-yard air dump cars, which may be considered a standard car with railroads and contractors using standard-gauge equipment, have two draft sills consisting of 15-inch steel channels weighing 45 pounds to the foot, with a substantial number of separators, cover plates, etc., riveted up in a substantial workmanlike manner, eliminating all castings subject to the falling of rock and such material, and substituting in their place forgings and steel plates. These cars are equipped with any type of M. C. B. automatic couplers which the purchaser desires. The bottom of these cars is of 3-inch white oak, or can be of all steel if wanted, with 10-inch center channel beam 33 pounds to the foot, running full length of the body, and also has two intermediate 4x6x $\frac{3}{4}$  angle irons, and two outer angle irons of 4x6x $\frac{3}{4}$ , all running the full length of the bottom. Between the two intermediate angles are placed seven truss angles, distributed the entire length of the body. These trusses are made of 3x3 $\frac{1}{2}$ x5/16-inch angle iron. The outside angle is trussed by two 1 $\frac{1}{2}$ -inch rods with turnbuckles. The body of the car is pivoted to draft sills by nine hinges, which are securely riveted to the draft sills, and the top hinge casting riveted or bolted to the 10-inch center channel on the bottom of the car. These castings are pivoted together with 1 $\frac{1}{2}$ -inch steel pins. The ends of these cars are built of either 3-inch white oak timber or 5/16-inch steel plate, securely fastened to the bottom of the car, and are braced from the center by means of a malleable casting riveted to the end and to the center channel of the bottom. The doors are constructed of steel 3/16-inch plate, reinforced horizontally at top and bottom by two 6x4x $\frac{3}{4}$  angles, securely riveted to them, running the entire length of the doors, and between the two angles 23 Stiffener angles of 3x2 $\frac{1}{2}$ x

5/16-inch are used. The cars are equipped with either New York or Westinghouse latest improved air brake equipment. Trucks are of steel construction, according to M. C. B. specifications, with capacity to suit the different sizes of the cars. The capacity of these trucks is from 50,000 to 100,000 pounds.

The air dump cars are equipped with a cylinder hung upright on each side of car. The piston rod for the cylinder is fastened to the bottom of the car at one end and to the piston at the other. Two reservoirs are put on each car, being placed between the draft sills, which insures absolute protection against falling rock. Air is supplied to the auxiliaries from the train line pipe with a check valve between, thus preventing the air from returning from the auxiliaries to the train line pipe. A valve is placed on the end of each car, with pipe connections running from the auxiliary and from the valve to the dumping cylinder, and either of the cylinders dumping the car on the side which they want to unload, and releasing this cylinder and admitting air into the other one rights the car. This car is under absolute control of the operator, and he can stop the car even after it is past the center of gravity, which enables the user to dump in any quantity desired.

A feature of special value is the toggle or lever arrangement for dumping the car, by which the lower edge of the door is thrown upward and away from the contents of the car, thereby minimizing the liability of any materials striking against the door and springing or wedging it. The lever performing this function also locks the door rigidly when the car is standing in a horizontal position. This is one feature of this car that is thought to be unequalled in cars of other makes. It appears on all Oliver dump cars.

Only one line of pipe is necessary to operate both the air dumping device and the air brake. Cars thus equipped permit any locomotive with standard air brake equipment to operate the air brake cars without having to equip the locomotive especially for air dump cars. A train of Oliver air dump cars can be taken to the unloading or dumping place and the locomotive cut loose from the cars, and they will still have enough air in the auxiliary of each car to dump the same three times. Any laborer can handle the Oliver air dump cars with as much ease and safety and get the same result as a mechanic or expert. These cars are also equipped so that the locomotive engineer can dump the cars and right them from the locomotive.

This car carries a large load; it can be dumped by one man; it is substantially built, and will withstand rough usage; it is built according to M. C. B. specifications, permitting the user to secure repairs in any railroad shop. The air for dumping is applied directly to the car body. It is dumped either side and righted by the move of a simple lever on the end of the car or on the locomotive.

The Oliver two-way air dump car appealed so strongly to the Government's construction engineers that they ordered 1400 for use in the Panama Canal work. They were sent to the Isthmus in 1908, and have been giving general satisfaction ever since.

Other notable users of these cars are hundreds of contractors, the Utah Construction Co., the Utah Copper Co., the Chino Copper Co. of Utah, Florida phosphate companies, the Lehigh Valley, the Missouri, Kansas & Texas and other railroads, and also the Canadian Northern, which is building through Northwest Canada. An order for 50 cars has just been filled for the Brazil Railroad Co., Soro Santos, Brazil.

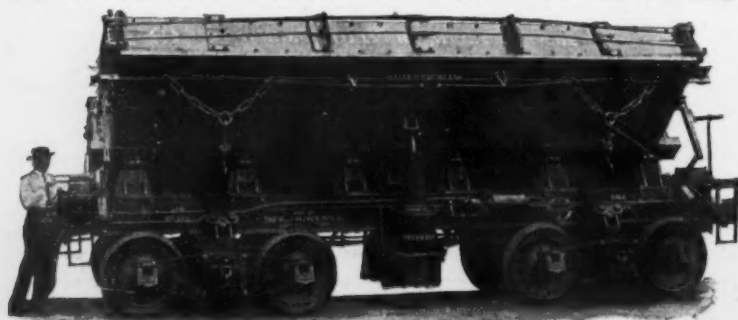
Dump cars of other types are made by the Wm. J. Oliver Manufacturing Co., but practically all of them bear the essential Oliver features described above, with such modifications as are suitable to their size and the particular purposes for which they are intended.

In mine equipment the company manufactures tripplers, drums, screens, mine cars and monitor cars for coal mines, marble quarries and limekilns. These cars are all of special design, gotten up by experienced mining engineers and draftsmen.

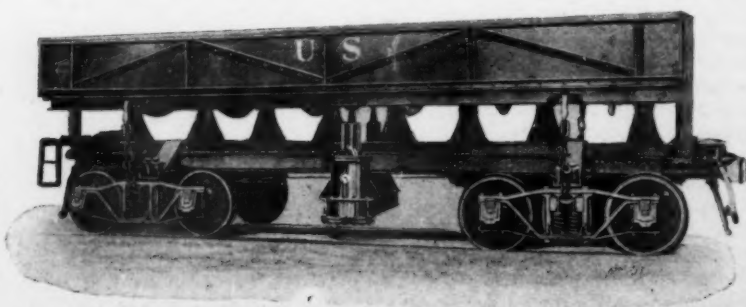
The equipment for marble quarries which the Oliver company makes embraces finishing machinery, rubbing-bed outfits, Hurst frames, derricks, and various kinds of special appliances needed in that character of business.

The plant is fitted for doing a general repair work in all the lines it manufactures, and many more besides, including steam shovels, locomotives and cars of all kinds.

Next to its special line of dump cars the most important part of the Wm. J. Oliver Manufacturing Co.'s product are plows, and first in importance among these is the special brand known as the Wm. J. Oliver Improved Chilled Plow. This implement combines within itself so many excellent features that it seems



12-YD. AIR DUMP CAR WITH STEEL UNDERFRAME AND WOOD BODY.



19-YD. ALL-STEEL AIR DUMP, FURNISHED THE U. S. FOR PANAMA CANAL.



to have them all, and stands unequalled as an implement of husbandry made to meet all possible contingencies.

The making of plows was added to the business of the Wm. J. Oliver Manufacturing Co. in 1908, when it bought out the plant and business of the Ground Hog Plow Co. and proceeded to further improve this plow by features patented in 1909, after which it began to make plows in earnest and to lay plans for selling them. The excellence of the plows and a selling campaign waged with vigor and intelligence brought in a few months a phenomenal demand for the Wm. J. Oliver Improved Chilled Plow, and before long its use was nationwide. Within the last few months, indeed, the demand has overstepped continental limits, and a big shipment of plows has been sent to New Zealand.

The Wm. J. Oliver Improved Chilled Plow boasts a locking device that adds greatly to the strength of the implement and preserves its original shape during its life. This prevents the plow from becoming loose and "rickety" in the joints or untrue or out of alignment. It is absolutely simple in construction, and the boy on the farm can take it apart or put it together as well as the man in the shop. It "runs true" in the furrow.

It is the only plow made that has interchangeable parts. When the owner of any other make of plow breaks some part and goes to town to get a new one he must remember the number of his plow, or the merchant will not know what to give him. When the owner of the Wm. J. Oliver Improved Chilled Plow breaks a part he goes to the merchant who sells the Oliver and tells him what part it is he wants, and gets it. The dealer in the Wm. J. Oliver plow carries but one kind of extras—they fit all kinds of Wm. J. Oliver improved plows. The plows are made with both steel and wooden beams, and everything about them, from point to handles, and from mouldboard to clevis, is of the best material and the best workmanship. The company is making about 100 different varieties of plows, with an annual output close to 50,000.

As the product of any manufacturing establishment can only equal the sum of the knowledge of that product possessed by the men employed by that establishment, the personal factor must enter largely into the manufacturing equation. What, then, is the knowledge, gained from experience, possessed by those who are active in the management of the affairs of the Wm. J. Oliver Manufacturing Co.?

William J. Oliver, founder of the company, its president, and its presiding genius in fact as well as in name, is a member of the Indiana family which for two generations has made the name Oliver known wherever an up-to-date plow is appreciated. When he struck out for himself he came South and engaged in the business of building railroads, as a contractor, in which he had amassed a fortune of a million dollars before he reached middle life. He mastered the contracting business in all its details. He knew every nut and every bolt in every machine he used in his work, and when something wore out or broke he knew just how much it ought to cost to repair or replace it. Finding that he was paying too much for his repair work, he bought out a foundry and machine shop where he could repair his own machinery. With a thorough knowledge of the work required of the equipment for the contractor's business, he added from time to time improvements to the machines

he hauled into the shops for repairs, and the consequence was that in the course of time certain things had been so often repaired and improved that they were more William J. Oliver products than the products of the plants which had manufactured them in the first place. This brought about the manufacture of such things in their entirety, with all the improvements which experience had suggested. In the matter of dump cars, for instance, Mr. Oliver knew the weakness and the strength of each individual part of each individual make of car, and each and every criticism made by his contractor friends and associates was considered. From this knowledge sprang the car which bears his name, and which has demonstrated its superiority from the Atlantic to the Pacific and from Canada to Brazil.

Mr. Oliver is president of the Knoxville, Sevierville & Eastern Railroad, and owner of the Savannah, Augusta & Northern Railroad, and connected with many other important business enterprises throughout the South. As a contractor he executed some of the largest contracts in the construction of railroads ever given to one man, and always with an expedition and a thoroughness that gave satisfaction to those who had the bills to pay. When the United States Government called for bids for the construction of the Panama Canal, Mr. Oliver was among the bidders who responded, and his bid was found to be the lowest and best. He qualified in every respect with all the requirements of the Government, and would unquestionably have been awarded the contract to do that great piece of constructive work had it not been that it was decided that the Government would itself do the work under the supervision of its army engineers.

Mr. Oliver, who is still on the sunny side of fifty, is an active, enterprising man, full of aggressiveness, and never so happy as when engaged in some great piece of constructive work that calls for the exercise of skill, energy and financial daring.

The vice-president and general manager of the Wm. J. Oliver Manufacturing Co. is L. E. Wooten, who began his business career at the age of thirteen as an apprentice in a railroad machine shop. Having served his term, he worked his way through the various positions in the shop, learning the details of car and locomotive construction, and then became a locomotive engineer before he was twenty-one years of age, with Mr. Oliver, on construction. From this position he became superintendent on some of Mr. Oliver's construction work, where he became fully conversant with the various kinds of equipment in use in such work. He afterwards served as general manager of the Savannah, Augusta & Northern Railroad, and then built the Knoxville, Sevierville & Eastern Railroad and operated it for some time. In these various positions Mr. Wooten became thoroughly familiar with dump cars of all kinds, and when, in 1908, Mr. Oliver secured the contract to deliver 1400 of his dump cars to the Isthmus of Panama for use in digging the Canal, he was selected by the superintendent of motive power on the Isthmus as superintendent of construction to erect the cars, which were shipped in a "knocked-down" condition. In that capacity he served the Government for eighteen months, gaining a still deeper insight into the requirements for an efficient dump car and how to perfect its construction. When he returned to Knoxville he was made vice-president and general manager of the company, bringing to the duties of that position a practical knowledge of dump-car construction not equaled, perhaps, by that of any other man in the country. This knowledge, gained from experience in actual shop training, as well as in the practical operation of dump cars on construction work, Mr. Wooten is exercising, with all the energy of a highly-energetic nature, in keeping the output of the company up to the highest standard of excellence, and in adding wherever possible such things as may tend to the further perfection of what he believes to be the most perfect dump car now being made.

Thomas Price Roberts, superintendent of the shops of the Wm. J. Oliver Manufacturing Co., served his apprenticeship as a machinist in the shops of the Asa Blevin Manufacturing Co. of Elmira, N. Y., builders of stationary engines, etc. He went to Knoxville when still a very young man and connected himself with the Knoxville Foundry & Machine Co. as machinist, a position he held for ten years. Later he was connected with the East Tennessee, Virginia & Georgia Railway, and with its successor, the Southern, for twenty-one years as machinist, toolmaker, foreman and general foreman. From that employment he went to the Wm. J. Oliver Manufacturing Co. in 1905 as superintendent of shops, a position he still holds. Mr. Roberts has supervision of the shops and oversees the construction of all the cars and other articles turned out from them. To this work he brings the same ripe experience and the same attentive energy that have made him a valuable man wherever employed.

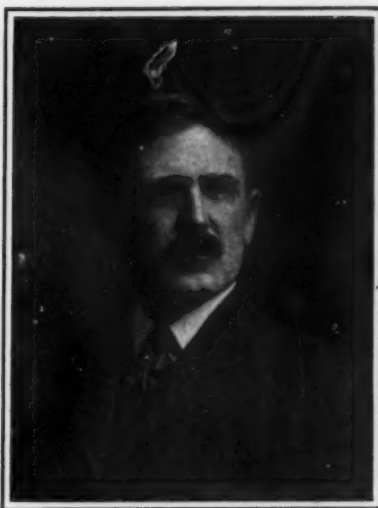
The head of the plow department is J. R. Rossetter, a man who has spent many years in the plow-selling and plow-making business, and who unquestionably knows as much about the practical construction of those very useful implements as any other man anywhere. After serving for seven years in a plow-manufacturing concern, learning every detail connected with the construction of plows, Mr. Ros-

setter conceived an idea for making an improved chilled plow. This plow he afterwards perfected, patented and manufactured for a number of years, until he sold his business and patents to the Oliver company. The original line has been considerably reinforced by the addition of plows of various other types, all of which embody the same patented features as the regular series of chilled plows. Mr. Rossetter has been at the head of the company's plow department since 1909, applying his knowledge and experience to turning out the best possible work, and always striving to find some way to improve an article that already seems to be well-nigh perfect.

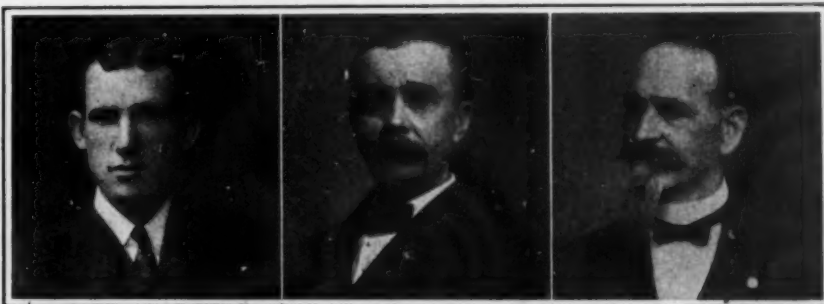
Thus it will be seen that Mr. Oliver not only is himself thoroughly experienced in the various lines of business to which his company is devoting itself, but, with the genius of the true leader of men, he has brought to his aid, and placed at the heads of the different departments of the plant, men of the broadest practical experience in their respective lines, to the end that whatever work is turned out of the plant shall be the best of its kind—made and finished in the highest state of perfection of which human skill and human ingenuity are capable—the product of brains and experience and inventive genius.

The motto the Wm. J. Oliver Manufacturing Co. works into the products of its plant is: Nothing but the best is good enough to bear this company's name.

The opportunities offered by the South to men of broad vision and energy for the creation of great enterprises are aptly typified in the history of the Oliver company. It is for this reason this story is published. Specific illustrations of what has been achieved in the South furnish the proof, if any were needed, to sustain the claims made in "The South: The Nation's Greatest Asset" as to the illimitable resources and possibilities of this favored land.



WM. J. OLIVER.



L. E. WOOTEN.

T. P. ROBERTS.

J. R. ROSSETTER.



# The Arkansas Colonizing Company

INCORPORATED

CREATED BY AN ARKANSAS WOMAN'S ENERGY AND BRAIN

## Lands



WITH the value of the products of its factories rated in 1912 at \$92,000,000; of its farms at \$168,375,000; of its forests at \$54,008,000, and of its mines at \$5,600,000, Arkansas shows a remarkable advance in general development.

Such a splendid showing could not have been possible had not Arkansas a soil and climate suitable to raising a wide range of products, vast forests of valuable timber, rich deposits of minerals in great variety, and all the needed advantages and requirements for manufacture.

Arkansas, agriculturally, is a wonderful State—a State in which the varying elevation from the Missouri line to the boundary of Louisiana gives it a sufficient number of degrees of latitude to enable farmers to raise semi-tropical crops and those of the temperate zone.

The advance in the value of farm products in Arkansas has been a notable one. In 1890 these were worth \$53,128,000; in 1900, \$79,649,000, and in 1912 they advanced to the splendid total of \$168,375,000, a complete and most convincing evidence not only of the richness and productivity of its soil and climate, but also of the increased attention which is being given to farming. Arkansas yields annually about 1,000,000 bales of cotton, valued at \$50,000,000 to \$75,000,000, and 60,000,000 bushels of corn, worth \$40,000,000. The growing of rice has also proven a very profitable industry in the State. Twenty years ago Arkansas was raising only a few hundred bushels, while last year there was a production of 3,405,000 bushels, valued at \$3,201,000. Ninety thousand acres were devoted to this crop, and the average yield per acre was 37.5 bushels, exceeding the average yield of all other Southern States. Conditions in Arkansas have likewise been found to be exactly suited for cattle-raising and dairy farming. Truck-growing has also reached large proportions, for this State is well situated in relation to the country's big consuming markets, and hundreds of carloads of vegetables of most every variety are shipped annually. Arkansas' orchards in the highland sections of the State are now famous for the variety and quality of fruits raised, and this industry is now of large commercial importance. Another indication of Arkansas' advancement is the fact that values of agricultural lands have increased 123 per cent. in the last five years.

In comparison with other States, Arkansas is a leading one in timber production, ranking fifth, with an annual cut of more than 1,750,000,000 feet. There is still an abundance of standing timber for the future development of this industry, as this State has an area of 22,400,000 acres of different woods of value, estimated to contain thirty to fifty billion feet.

The minerals of Arkansas cover a wide range, including coal, lignite, bauxite, asphalt, zinc, lead, clays, marble, phosphate rock, fuller's earth, soapstone and building stones. Natural gas, too, has been found within the confines of the State, and a number of valuable wells are producing steadily.

These many raw materials for manufacture supplied by the variety of the State's mineral and timber resources, together with its coal, lignite, natural gas and hydro-electric power available through its many rivers, combine to present opportunities for manufacture that are most inviting. And when it is considered that the value of manufactured products of Arkansas advanced from \$45,198,000 in 1900 to \$92,000,000 in 1912, or more than double, there can be no question as to general all-around advantages this State possesses for manufacture.

These are some of the reasons to which can be attributed the rapid growth of the State in recent times. For years, during the time that the Indian Territory was closed to settlement, Arkansas developed slowly. When that Territory and Oklahoma became a State, the gates of Arkansas admitted the people of the world who flocked across her border. In passing, these people beheld for themselves Arkansas' vast storehouse of riches. Many having been impressed with these remembered them, and came to settle here, and also induced others to follow them.

Many forces are now working to bring Arkansas' advantages to the attention of prospective investors, manufacturers and new settlers. There is a co-operation in this work between real estate and colonization companies, the railroads and the State officials, and the splendid results being achieved are reflected by the notable advance which Arkansas is making in every line of activity.

A leader in the development of Arkansas is an Arkansas woman, the president of one of the leading real estate and colonizing companies of the Southwest, a woman of rare business talents, and who has made a tremendous success without in the least losing the attraction of the eternal feminine. The daughter of a minister, a teacher, a model of womanly propriety—a success in business life as she is in the private circles. A few years ago holding a most important clerkship in the Arkansas Legislature, so well was her work performed that when Oklahoma's first legislative session was held they sought and secured her services, and she won the gratitude of the business people of that State to the same degree that she held it in Arkansas.

This woman is the president of the Arkansas Colonizing Co. of Little Rock, Ark., with offices in the new building of the Bank of Commerce. She is thoroughly familiar with the largest affairs in the State, and has successfully negotiated many of the largest real estate timber deals and colonization plans ever handled in Arkansas. She has the confidence of the railroads, the leading financial institutions and the business public in a general, broad way. Her

integrity and business acumen have won for her a complete and deserved success, and largely through her efforts the Arkansas Colonizing Co. has attained the high rank it holds as a leading land and colonizing company in Arkansas and the Southwest.

As evidence of her diversified activities, she has completed arrangements for building a standard-gauge railroad of considerable length to develop properties that she saw had been lying dormant many years, but which needed transportation facilities in order to bring them to the front. The difficulties presented by such an undertaking were of a nature to call for the best in men experienced in such work, but she overcame all obstacles.

The Arkansas Colonizing Co. has large properties of its own, one of these being a few miles north of Camden, Ark., on the St. Louis & Iron Mountain Railway. The battle of Poison Springs was fought on this track. From a white oak tree cut down on this property recently there was taken a bucket of lead from bullets shot into the tree while that battle raged.

This company has the confidence of the owners of cut-over timber lands in Arkansas, and from a number holds the exclusive contracts for the sale of their properties. These lands are being sold to men of large means, large insurance companies, to British syndicates and other investors in Southern properties.

Arkansas lands are now sought after more than ever before in the State's history. The Arkansas Colonizing Co. is well prepared by virtue of its wide range of experience and intimate relations with Arkansas people and conditions to give sound advice concerning lands in the State and to direct investors to opportunities to secure properties that are desirable or suitable for special developments of various kinds.

The company has a large clientele of financiers and investors. Its business has been built up by reliability and a reputation for absolute honesty in all things, large and small. It handles big deals; it does things in a big way. The president of this company has been known to spend as many as eleven months in the woods of Arkansas getting her knowledge and information at first hand. The other members of the company are thoroughly acquainted with every nook and corner in the State.

On one of the company's properties, in what is known as the Ouachita or Camden field, is a tract of 2400 acres containing a large deposit of lignite. Dr. George W. Kimball, a metallurgist of Chicago, now located at Camden, Ark., after nine years of experimental work pronounced this lignite to be of the finest grade. It is said to be different from any other lignite ever discovered, and from it Dr. Kimball has obtained 127 different by-products. When this lignite comes from the ground it resembles ordinary soft coal, except that it is more oily and slightly softer. It is suitable for domestic uses, but far too valuable for such purposes. A quantity of this lignite is placed in a retort. At about 180 degrees Fahr. a colorless water begins to flow from the coal. It averages 100 gallons per ton of lignite. At about 250 to 300 degrees a dense yellow vapor arises. Part of this vapor is condensed into oil, yielding 20 gallons from a ton of coal; the remainder forms a colorless and odorless gas. When the refining process is completed about 900 pounds of pure carbon is left in the retort. Of the 127 by-products obtained, not one is wasted or lost. The water contains some tanning matter that greatly facilitates the tanning of hides. The gas obtained burns with a bright flame and is of a better illuminating brilliancy than gas made from any other coal. The oil is used in the manufacture of many medicinal products, and in making paints, and a most excellent soap is made from the residue. The residual carbon is used for making a waterproof structural iron paint, and for three years has been used by the elevated street railways of Chicago, and is pronounced by them to be a perfect structural iron paint. The oil is used often and successfully in the treatment of hay fever and asthma. The oil has been analyzed and found to contain about 1 per cent. creosote and ammonia. The remaining 99 per cent. is not composed of any material now known to chemists, and has been named "Ark-Oil," in honor of the State where it was first found. The manufacturing concerns that buy this oil work it into more than 100 different medicinal preparations. It is also used as a disinfectant.

The most valuable of all uses to which this oil is put, perhaps, is as a preservative of wood. It rapidly permeates all woods and prevents decay for many years after treatment. In the manufacture of the various products there is absolutely no waste; every pound of lignite put into the retort is accounted for by some finished product.

The gas can be made in quantities at a cost of only six cents per 1000 cubic feet, and no very intricate appliances are needed for manufacturing this gas. There is so much of this coal in Ouachita county alone that gas enough to supply the whole State of Arkansas could be made for a hundred years without appreciably diminishing the supply. A fire clay bed of excellent quality lies eight feet thick above and fifteen feet thick below the coal deposit, running approximately 20,000 tons to the acre. Its excellent quality is put beyond doubt by a most exhaustive chemical analysis and by furnace tests, made by experienced clay manufacturers.

Capital interested in developing these and similar properties in Arkansas, whether it be capital in Europe, Canada or the United States, is invited to correspond with the Arkansas Colonizing Co., Little Rock, Ark.

# Dunbar, West Virginia, Model Site For Various Industrial Enterprises

## New Town in Kanawha Valley That Presents Inviting Opportunities for Manufacturing Plants



**D**ESIGNED, planned and plotted for a model manufacturing town, Dunbar, lying on the Great Kanawha River, six miles downstream from Charleston, W. Va., presents attractions as unique and inviting as can be encountered elsewhere in the country. Possibly its story is told better in the words of Col. Fred Paul Grosscup, originator and manager of the company owning it, than in any other way.

"The foundation of Dunbar," said Colonel Grosscup, "was the physical expression of a desire that has obsessed me for a good many years—that of building a manufacturing suburb that would offer to factory owner and artisan conditions of operation and employment combining the best opportunities for profitable business with the best possible living conditions. In building a town of the highest class from the workingman's viewpoint, there are five essentials—a good rich garden spot for the home, pure water, steady and lucrative employment, proper amusements and cheap transportation to and from city shops and markets.

These essentials are all provided at Dunbar. In securing the site I chose one that had been a market garden, and the soil of which, naturally fertile, had been greatly enriched by the application of natural fertilizers for a number of years. Then I had the lots laid off of sufficient size to give each householder enough ground for a garden in which he can raise all the vegetables his family can consume.

"An abundance of pure freestone water is secured by sinking wells, and this will be pumped into a reservoir located sufficiently high above the town to give the necessary gravity pressure for fire as well as domestic purposes.

"There are already established at Dunbar a number of industrial plants to furnish employment to many people, and other plants will be located as rapidly as possible.

"We are building an amusement park, which will have many attractions during the summer months. We have an artificial lake for boating, and a good race track upon which a matinee driving association gives interesting races during the season.

"The traction line already built to the lower end of Charleston is being rapidly constructed to the center of the city, and will soon be running its cars through the streets. When this line is finished Dunbar will be but 25 minutes from the Charleston postoffice. The fare will be five cents, and the citizen of Dunbar can have the advantages of Charleston's churches, shops and theaters on equal terms, so far as cost is concerned, with the Charleston citizen who lives half a dozen blocks from the business center of the city.

"We believe these advantages will bring to Dunbar laborers of the very best class, a most attractive possession for any community that wishes to secure manufacturing enterprises.

"For the manufacturer Dunbar has many inviting features. First among these, perhaps, stands the abundant supply of high-grade fuel at low cost. The Dunbar Land Co., which owns the Dunbar townsite, has a subsidiary company known as the Charleston-Dunbar Natural Gas Co., a corporation organized for the purpose of bringing natural gas into Dunbar and selling it there at a price that will prove attractive to manufacturers. This gas company now has three lines into the town, from as many different gas fields, each independent of the others, and with an aggregate supply that promises to last for many years. The gas company, being controlled by the same people who make up the land company, and whose chief interest lies in building up their industrial town, guarantees the low price of this most desirable fuel, and the man who establishes his manufacturing plant at Dunbar is thus saved from the danger of greatly advanced prices. Those who find other fuel preferable to gas can be accommodated at Dunbar, for the best steam and coking coals of the country are within easy reach by rail and water, and can be laid down at Dunbar at the lowest possible cost for freight. The fuel factor of the manufacturing equation is solved at Dunbar for all time.

"In the matter of transportation Dunbar is well provided for. It is situated on the Great Kanawha River, a stream that has been locked and dammed by the Government, making it navigable for boats of considerable size throughout the entire year. With the creation of a nine-foot stage in the Ohio, from Pittsburgh to Cairo, an undertaking upon which the Government is now engaged, and which will be pushed to completion as rapidly as possible, there will be perpetual water transportation from Dunbar to the mouth of the Mississippi, and thence to all the world's ports.

"In addition to transportation by water, Dunbar has the advantages coming from three railway lines. The Kanawha & Michigan Railroad runs through the town, and the Chesapeake & Ohio and Coal & Coke connect with it at Charleston. By arrangement with these roads Dunbar takes the Charleston rate on all, without switching charges, and a car loaded at the factory platform in Dunbar goes to any point on either line, or to any connection of either line, at the same price it would pay had it been loaded into a car lying on a siding of either line in the city of Charleston. The Kanawha & Michigan runs into Ohio and there connects with the Toledo & Ohio Central and many other roads leading into the various centers of business in the West. The Chesapeake & Ohio carries to ocean terminals on Hampton Roads, and to

Cincinnati, Louisville and over connecting lines into all the cities of the middle and farther West. The Coal & Coke runs northeast and connects with the Baltimore & Ohio and the Western Maryland, and through them with a network of roads to the East.

"For local passenger transportation the Charleston-Dunbar Traction Co., also a subsidiary of the land company, has built an electric line to the city limits of Charleston, and is now engaged in building it through the streets to the center of the business district. This is a road of first-class construction, laid with 70-pound steel rail, and equipped with cars of the best type. In fact, it is, in construction and equipment, an electric line of the highest class. Built to help serve the ends for which the town of Dunbar was founded, that of making a model manufacturing suburb, the fare on this road between Dunbar and Charleston will be kept at five cents. This will give the Dunbar manufacturer the benefit of the Charleston labor market, for with a five-cent fare and a 25-minute service workmen having their homes in that city can cheaply and conveniently go to their work in Dunbar, just as those who make their homes in Dunbar can find their employment in Charleston if they so desire.

"For raw materials the Dunbar manufacturer has many sources from which to draw. All about are glass sands, some of them of the highest quality known to the country, and these latter especially within easy reach by direct rail route. The first glass made in the Great Kanawha Valley was produced less than half a dozen years ago, and now there are glass plants in a number of different places, including Dunbar, and the outlook is bright for many more within a very short time. In fact, there are well-posted people who express the belief that the Great Kanawha Valley will become, within a few years, the greatest glass-making section of the entire country.

"The fame of West Virginia's hardwoods is co-extensive with the country's boundaries. The poplar, the oak, the maple, the chestnut and various others are of the very highest quality and are much sought after by woodworkers everywhere. Dunbar lies well within the zone of the timber production, and with its numerous advantages of physical position is the logical location for furniture factories and woodworking plants of many other kinds. Millions of feet of timber can be brought to its saws by water, while other millions can come cheaply by rail from nearby forests, and there is no spot anywhere upon which it can be more economically made into its various finished products, or more easily or economically distributed throughout the country's largest centers of population and commerce.

"Iron and steel can come to Dunbar from the Pittsburgh district direct by water, and therefore the location is an excellent one for the manufacture of steel and metal products of various kinds. Shales and clays of high quality lie about on every hand, and the opportunities are good for making brick, tile and other things of like nature. In fact, there is hardly any article in the manufacture of which fuel plays an important part which cannot be economically produced at Dunbar.

"In laying off this industrial town the company carefully preserved the sites that were thought to serve best as the locations for manufacturing plants, and these will be found, I think, especially eligible, in respect of convenience to wharves and railroad sidings. The residence lots are of sufficient area to provide a good-sized garden with each home, the water is abundant and of the best quality, the streets are wide and straight and well-graded. A good many houses have already been built, and the company will begin the construction of 100 more at an early date. These houses will be well built and will contain all the conveniences of modern city homes. They will not be expensive, but they will be comfortable. Just the kind, in short, that should appeal to the artisan and wage-worker of the better class, and for such they are intended.

"There are now in operation at Dunbar a number of manufacturing plants, more will be located there with the opening up of spring, and I believe another year will see a very considerable increase in its industrial concerns. We will be glad to hear from anybody with reference to the location of such plants, and will do all we can to encourage the location of such as are well-founded and worthy, for we believe if they can be operated at a profit anywhere they will be successful at Dunbar."

Such is the story of this new industrial suburb as simply told by the man who planned and founded it, and whose chief ambition is to see it become the model of its kind. Colonel Grosscup and those who are with him in this enterprise have aided in many ways in the growth and progress of Charleston and the valley of the Great Kanawha, and have been the active and aggressive force in some of the leading developments of the city and section, but in no other have they embarked upon an enterprise that promised so much along lines of substantial industrial development as in their Dunbar undertaking. Backed by ample capital and directed by the highest intelligence, the Dunbar Land Co. and its two subsidiaries, the gas and traction companies, should, and doubtless will, make of Dunbar what Colonel Grosscup and his associates have intended it should be—the model industrial town in one of the greatest industrial States in the South.



## Typical Crops on Louisiana Reclaimed Lands



CORN IN JULY ON RECLAMATION LAND, NEAR NEW ORLEANS, TYPICAL OF ALMOST LIMITLESS POSSIBILITIES.



GATHERING LATE CROP OF IRISH POTATOES, CORN HAVING BEEN PLANTED BETWEEN POTATO ROWS. PHOTOGRAPH TAKEN IN JULY.

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# Reclamation Potentialities of Louisiana

## A National Asset Worth Billions

### THE RICHEST LANDS KNOWN TO MAN NOW BEING UTILIZED—GREAT DRAINAGE AND SETTLEMENT OPERATIONS



IN the so-called swamp lands of the South there is a potentially richer asset of this nation than all of the gold and all of the timber the United States has ever contained.

The gold, always an inferior product compared with the one item of cotton production in the South, does not reproduce; a merchantable tree requires from the thirty years of a loblolly pine to the thousand or more of a cypress to attain its growth, while every acre of Southern swamp lands can be made to produce from one to four crops, worth from \$15 to \$500 an acre or more, every year, to the end of time.

The alluvial wet lands of the Louisiana delta, some five million acres in extent, lead all the other so-called swamp lands in richness and fertility and are susceptible of the production of hundreds of millions of dollars' worth of foodstuffs every year.

The country is just now beginning to wake up to the significance and importance this situation contains.

Only seven years ago it was difficult to find any number of people, even in New Orleans, who believed the wet lands of Louisiana were susceptible of successful drainage at all, while outsiders turned deaf ears to the arguments in their behalf. Now only the obstinate refuse to recognize the tremendous possibilities for agriculture in these same lands, while outside capital by the millions is actually employed in the work of drainage and pumping that is transforming thousands of acres every year into farm lands of fertility unsurpassed on the globe.

Twenty-five companies are at work around New Orleans with ownerships of half a million acres; between thirty and fifty dredges—the number being added to all the time—are at work cutting canals and ditches; fifteen thousand acres have been made ready for the plow, and more than 150,000 additional acres are involved in the plans of companies in the field.

The movement is on, and with accelerating speed it is now proceeding to the inevitable goal of the utilization of every acre of this most marvelously rich soil for the cultivation of corn, cane, truck, vegetables, oranges and livestock as well, until South Louisiana shall have become the most densely populated and most prosperous region of the globe.

Exhaustive laboratory tests have revealed the phenomenal richness of the soil. It contains enough nitrogen to raise a thousand crops of corn, 75 bushels to an acre. Every variety of garden truck and vegetables can be raised bountifully and early. California fruit growers are enthusiastic over the possibilities of vastly extending the long established orange and grapefruit industry here, there being no finer specimens grown than the Louisiana sweets in oranges and the varieties of grapefruit raised.

With a soil hundreds and thousands of feet in thickness; with river, rail and ocean transportation at the door, and with additional shipping facilities provided by the deep and wide canals drainage requirements will create; with the close proximity to all the great market centers of the country, thousands of miles nearer than the Pacific coast orchards and farms; with the chief city of the South as the central shipping point; with a climate of statistically demonstrated great healthfulness and conspicuous salubrity, the bugbear of unhealthfulness having been entirely eliminated by science and drainage, the foundation for a vast development exists here as in no other section of this or any other country.

A recognition of this fact by the world at large seems imminent now. South Louisiana at last appears to be coming into its own!

Misunderstandings as to the nature of the alluvial wet lands' character and formation and the methods of their so-called reclamation are being cleared away.

Except in the cases of infrequent crevasses or breaks in the Mississippi River system of levees—and protection under national auspices, until this danger shall have been as certainly eliminated as in the case of vastly more difficultly dyked Holland, will inevitably be provided—there are no overflowed lands in the lower Mississippi delta. The swamp lands here are simply level stretches of silt and humus on which rain water falls, accumulates and saturates, without opportunities for sufficient drainage in the natural state. The levees of the river shut out any original drainage that occurred, for no streams flow into the Mississippi for hundreds of miles above the mouth.

The water in the rivers, bayous and streams must thus find an outlet into the Gulf of Mexico through channels other than the Mississippi.

Drainage operations therefore consist in digging canals, reservoirs and ditches with sufficient depth to draw all the surface water off, when, with adequate pumping plants and levees of proper height and strength thrown around a district to be drained, the water can be lowered to six feet or more below the surface by being pumped into lakes and streams that have their outlets in the Mexican Gulf. Thoroughly drained tracts are thus right now placed in identically the same position as is New Orleans. Before the installation of the present admirably complete drainage system water was found within a few inches of the surface anywhere. Then a pumping process was necessary as a preliminary in the construction of any city building. Now dry earth is found in any excavation to a depth of six or more feet, and cellars and basements are frequent instead of being wholly unknown, as was the case within very recent years.

One retarding feature in the wholesale drainage of Louisiana's wet lands was the lack of statutory provision for drainage bonds to secure funds for

the cost of the work, ranging from \$15 to \$35 an acre, in accordance with the heaviness of the work to be undertaken.

The State Legislature in 1910 passed a law enabling owners to form drainage districts and issue bonds, under the direct supervision and responsibility of the State Board of Engineers, the proceeds to be devoted solely to drainage purposes, and to be paid for when issued by a fund collected as a tax by the State running throughout a long term of years on the lands in the district affected. The proceeds of the bonds when sold are available as needed to pay for drainage work. The tax is in the nature of a first lien on the property, and its levy and collection are made the imperative duty of the drainage board and tax collector. The lands must be sold for taxes if not paid each year, though only one year's taxes are payable at one time, the whole amount covered by the issue not becoming due in case of default as in a mortgage. No court proceedings are necessary, the property being simply advertised for sale for taxes, the cost for which would not exceed from \$5 to \$7 in the case of any single transaction.

In operation it is unconceivable that any difficulty would occur in securing the \$2 an acre or so which would represent the amount of any one year's taxes—for any land included in a drainage district would be worth many times more than the entire taxes of any one year.

The constitutionality and validity of the law have been affirmed by the Supreme Court, and the bonds are declared to be remarkably well safeguarded and secured. Although not generally understood by bond buyers as yet, several issues have been marketed at favorable terms, and it is predicted that within a few years no bonds on the market will find a more ready sale than the Louisiana reclamation bond.

It is recalled that in the early years of the Louisiana levee bond it was not in popular demand, whereas now it sells readily at 118 or so, and the prediction is made that the reclamation bond will have a similar history, to the vast advantage of the bond houses and purchasers who early take hold of these securities.

An interesting and illustrative review of the drainage proposition in Louisiana is furnished by John A. Kruse, an eminent engineer and drainage expert, with offices in Chicago and New Orleans, who is in charge of a number of the most important enterprises in Louisiana. He has had a wide experience in this country and in other countries of the globe, and is thus qualified to give an expert opinion. Mr. Kruse's statement of the case is given herewith:

"The reclamation by drainage of the 75,000,000 acres of so-called swamp land of the United States is the most important question to the people of this country that has been brought to their consideration since the Civil War. Its importance to all the people of this great country and the magnitude and scope of its results are so vast and far-reaching that it dwarfs into comparative insignificance even the work of digging the great Panama Canal. The reclamation of this, the best land on the continent, will bring into bearing an area of land which will have a producing capacity sufficient to support a population almost, if not quite, equal to that of this country today; an area of land with a producing capacity (measured in dollars and cents) which will range from three and one-half to four billion dollars per year; an area of land which will provide homes for millions of people, and food and clothing for still more millions. Of this area of the most fertile land there is a particular portion which may be called the 'Best of the Best.'

"It consists of about five millions of acres of land which, in the language of an eminent engineer of wide experience in the Government reclamation service, 'is unequaled.' There is no other like area known to the white race which will support so dense a population. This great area of the most fertile lands the world has ever known, or probably will ever know, is called the Lower Delta of the Mississippi, the wet and overflowed lands of Southern Louisiana. This statement is borne out by logic of the situation, because his great area is made up of the cream of the top soil of the richest lands of 26 of the richest States of the Union, which soil has been carried down by the mighty Father of Waters, the great Mississippi River, and deposited on the floors of the Gulf of Mexico, forming a soil averaging from 1000 to 3000 feet in depth and comprising the area mentioned.

"Not only are the reclaimed lands the richest and most fertile of any in the locality in which they are situated, in whatever community, county or State, but they have proven to be the richest lands of all the countries of the globe. Two-fifths of the entire kingdom of Holland is drained land, and a great portion of it was recovered from the sea, and this great area became, and is, the most fertile part of the lands of Holland. Owing to the production of these lands, Holland developed two great seaports, Antwerp, the third export city of the world, and Rotterdam, the fifth. The reclaimed lands of Belgium, Denmark and portions of Germany are the most fertile of those countries.

"Reclamation in Holland at the time it was undertaken was a stupendous problem, because they had to fight back that great enemy, the enemy of the floods from the rivers, as well as to resist the invasion of that greater foreign enemy, the sea, which is restrained by the raising of big levees around the land to be reclaimed, of sufficient height and size to hold out a daily tide of 31 feet maximum. The base of these levees is 250 feet wide and they are from 42 to 60 feet high. The cost was very great, but notwithstanding that the work was undertaken by the government, and through it Holland was



made a great kingdom. Thirty-eight per cent. of the cultivated lands of the kingdom are below the level of the sea at high tide.

"England has had its reclamation of its swamp lands and fens. England was beginning to realize that with her increasing population the available area of productive land would not support them, and she turned to her fens or swamp lands for relief as the means to feed her people, and she found that by reclaiming these lands she had brought into productiveness such a rich territory as to enable her to reach out and establish colonies in all parts of the world.

"In the eighth century nearly 6 per cent. of the total present cultivated area of the continent of Europe was known as unreclaimable morasses, and since the same has been reclaimed that land is supporting upwards of 35 per cent. of the population of that continent. Twenty per cent., or one-fifth of the entire present cultivated area of England and Ireland, was marsh or swamp lands in the days of the Saxon kings.

"These reclaimed lands of Europe have a market value today of from \$1000 to \$3000 per acre.

"We see what has been done in the foreign countries. Reclamation was accomplished at an immense cost in those days, because none of the present modern dredging machinery was known, and yet it has paid for itself thousands of times over and has enriched not only the countries in which the lands are located, but also the population of those countries. And today those reclaimed lands are the backbone of many of the great nations of Europe.

"The swamp or wet lands included in the list of reclaimable lands in Government reports, all of it, every acre, in every section, as judged by what has been accomplished in Illinois, Iowa, Missouri, Louisiana and other States in this country, is as rich, if not richer, than any of these European lands. The results have shown that the reclaimed swamp lands are the richest lands in every State and in every country in the world. But the richest and most fertile of all these wet lands, the richest of all the swamp lands in the world, the richest large area of land of any kind that is known to the human race the world over today, is that great tract of alluvial land in the lower delta of the Mississippi River within the borders of the State of Louisiana.

"All swamp lands are formed, as is well known, by the depositing of soil that is washed down from the slopes of the surrounding watersheds into the valleys by the streams of the country. At the same delta of the Mississippi, in Louisiana, there is the most fertile land of the world, because it represents and is built up from the richest soil of the greatest drainage basin on earth; in fact, it is the cream of the top soil of twenty-six of the richest States in the United States, and is therefore the most fertile soil known. These twenty-six States included in the drainage area of the Mississippi River have for centuries been giving up the cream of their top soil to make up the delta of the Mississippi River. Ohio, Kentucky, Indiana, Illinois, as far east as Pennsylvania, Minnesota and the Dakotas on the north, Missouri, Kansas, Iowa and clear into Montana, all have contributed to the results, and all the soil so given has come from the top soil of the best farms that exist there, carried by the rains into the streams, thence into the great river, to make the finest mixture that is possible for a chemist to compose from all the elements of all of the soils of the world carried down and deposited on the floors of the Gulf of Mexico, forming that great region. This work is still going on and will not stop while the great forces of nature continue, and that great robber, the Mississippi River, is still taking away the soil from our farms with every rainfall, carrying it down into the rills, thence into the rivulets and streams on into the mighty Father of Waters, to be by him carried down where it has built up that great area of the most fertile land known to man.

"Experiments have shown a depth, all over the delta, of an average of upwards of 1000 feet, and at one point where a depth of over 3100 feet was reached, this being the deepest boring being made in the section, the drill was still in the soil when the drilling ceased. That soil is not only the cream of all these different farms, but all of the cream of these richest farming States has been amalgamated, mixed together and deposited there, and it has had for centuries a wonderful growth of vegetation which produces the organic matter commonly known as humus. And in such a genial climate—in a place where the hours of sunshine are so many every year, with the many more hours' growing time than in the States from which the soil was taken! This top soil or humus silt, in itself, would be worth a large amount of money transported back to the farms from which it came, if used as commercial fertilizers are used today.

"The same necessity that forced the reclamation of the low lands of Holland and the fens of England is forcing the reclamation of our swamp area. Within the last decade the attention of the capitalist and the farmer has turned to the great alluvial deposit of the lower delta. The wonderful richness of its soil, its healthful climatic conditions, its adaptability to the growing of the greatest variety of crops, its long-growing period, its nearness to market, have all combined to bring this area into public attention. The work of reclaiming the lower delta country is well under way, and is being pushed with great vigor. The reclaimed lands are being eagerly bought by the thrifty farmer from the North, and he finds in their wonderful soil and salubrious climate a veritable mine of wealth.

"When it all is drained, as it can and will be unquestionably within a very few years, it will have the capacity of producing one billion dollars per annum, or more than twice the total gold production of the world, and this production can be maintained, not for one year, not for ten years, but for all time.

"It will have the capacity of producing each year a sum sufficient to pay all the present expenses of running this great Government. These fertile acres in the delta region, when reclaimed, will provide homes for millions of people. On the basis of population of Holland they would take care of and furnish homes for 7,500,000 of population. On the basis of the population of the reclaimed lands of England, including the cities and towns, and with New

Orleans as the great center, they would have the capacity of sustaining a population of upwards of fifteen millions. Based upon the productive capacity of portions of this area already occupied, that is, the lands tilled by the Acadians, the people romantically described by the poet Longfellow in his 'Evangeline,' who are now living along the Bayou La Fourche, Teche and others, they would have a capacity of providing homes for upwards of six millions of people. President Roosevelt, in his annual message to Congress December 4, 1907, said:

"As an incident to creating the deep waterway down the Mississippi, the territory lying adjacent to the Mississippi along its lower course will therefore become one of the most prosperous and populous, as it is already one of the most fertile farming regions in the world."

"The prediction contained in President Roosevelt's statement is based on the fact of the great and enduring fertility of this region, a fertility equal to, if not exceeding, any other equal area in the world.

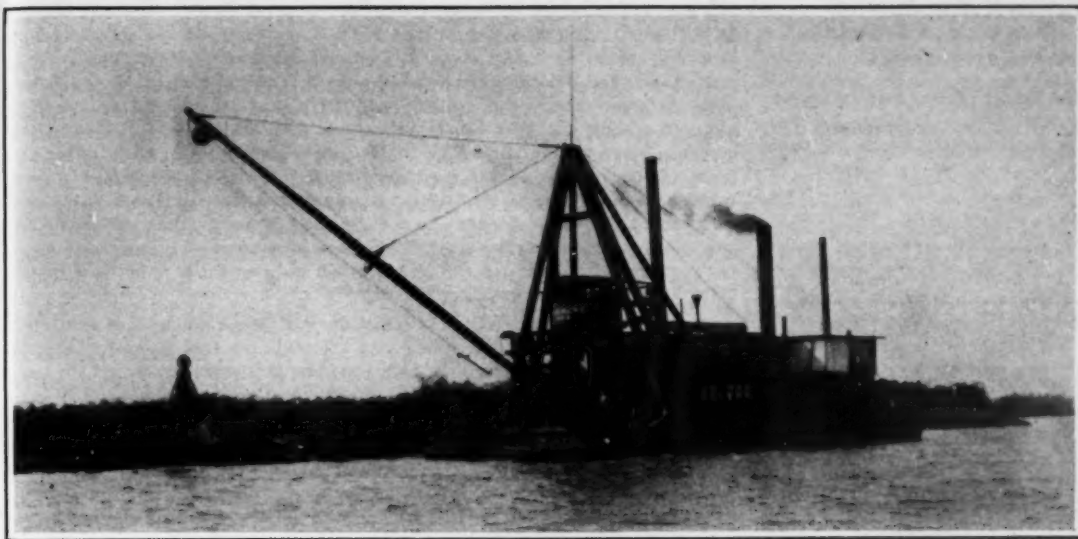
"This great area of the most fertile land of the world has been so fortunately placed by nature that it possesses every advantage that the cultivator of the soil may desire in an equable and healthful climate, where the hours of sunshine per day, month or year are greater than in any of the farming sections from whence the land was taken; with a well-distributed rainfall; at the doors of the great bulk of our population, surrounding one of the great cities of the world, thereby insuring markets for the products at all times, this area, when reclaimed and occupied by an intelligent agricultural class, will not only be one of the most productive, healthful and beautiful districts in the world, but is bound to become the mecca of the tourist, the sanitarium of the invalid and the winter playground of the people of this continent. It is doubly important at this time and in this city, because it means that the predictions made by Thomas Jefferson, at the time of the Louisiana Purchase, are about to be fulfilled, because it means that New Orleans is going to become, as he said, one of the great world cities. It is important because this city, now one of the great seaports of the world, is to become a densely populated city with a surrounding prosperous agricultural population of from five to fifteen millions of people within a radius of 100 miles. It is important at this time because the great vast area of free and cheap lands which the Government heretofore possessed has been exhausted; because with no further virgin soil to be placed in cultivation except these unreclaimed areas, our population is increasing at such an accelerated rate that fear is expressed in economic circles that we may become importers of foodstuffs instead of a nation made great by the exportation of these products, and it has been stated that our population will be doubled by the year 1940. We have read the statement made by the President of these United States in his speeches, that the lands susceptible to cultivation were exhausted, and that we must look to better and more intensified cultivation of the present areas if we wish to avoid becoming a food-importing nation.

"The statistics show that in the last decade the area in cultivated land increased but 4½ per cent., while the population increased nearly 22 per cent. at the same time. When it is taken into consideration, further, that this Government is now spending \$15,000,000 a year in teaching methods of more intensified farming that we may increase the production per acre to such a point as will take care of our increasing population, it being impossible to further increase the area of land capable of cultivation, these considerations make the subject of drainage reclamation one of the utmost importance to the people of this city and State; in fact, to all of the people of this great nation.

"As related to the reclamation of these lower delta lands the engineering problems seem simple, and it is indeed simple as compared with many of the engineering problems which have been solved by engineers throughout the world. Simple and cheap as compared with the reclamation of the lands of Holland, Belgium, Germany or England. But its very simplicity may be a source of great danger for the reason that, simple as it looks, and is, it presents many problems which must be solved. Each reclamation project presents difficulties and problems of its own, and while the entire question of drainage is founded on great underlying principles, the conditions are so different and vary so much as between the different and various sections of the country, as well as the different projects in the same sections, that each one requires the careful consideration of the drainage engineer.

"Even with all the data that can be collected there is still the liability of error in drainage engineering on account of the lack of constants and the different conditions in different districts. Mistakes have heretofore been made in this respect by eminent engineers, one of the most notable instances being that of the drainage of the fens of England. When the work was really begun by King Charles I there was great opposition to it, and the most noted engineer of Holland, Cornelius Vermuyden, was employed to make the plans and take charge of the work. The plans were made by him and were based upon conditions with which he had dealt all his life in the reclamation work in Holland, and they were not at all suited to the conditions existing in England. As a consequence the estimates of costs were found to be too low, and the Government of England had to come to the rescue of the project of guaranteeing the bonds three different times after the necessary changes and alterations of the plans of this great engineer had been made.

"There are none of these difficult problems to be encountered in the reclamation of these most fertile Louisiana lands; in fact, it is not reclamation, as the mean level of the land is above the high tide level of the Gulf. It is therefore simply a drainage proposition. The land being so nearly level, and having such a luxuriant growth of vegetation, the heavy rainfall cannot run off without artificial channels to carry it away; therefore, the accepted or standard plan is to enclose the unit or tract to be reclaimed within a levee or dyke, to prevent an overflow from the occasional severe storms of the Gulf or a crevasse in the levee of the Mississippi. The building of the levee gives the land the advantage or benefit of a navigable canal all around the enclosed unit, which canal connects with all the great waterways of the State. The drainage is accomplished by a system of reservoir canals, laterals and

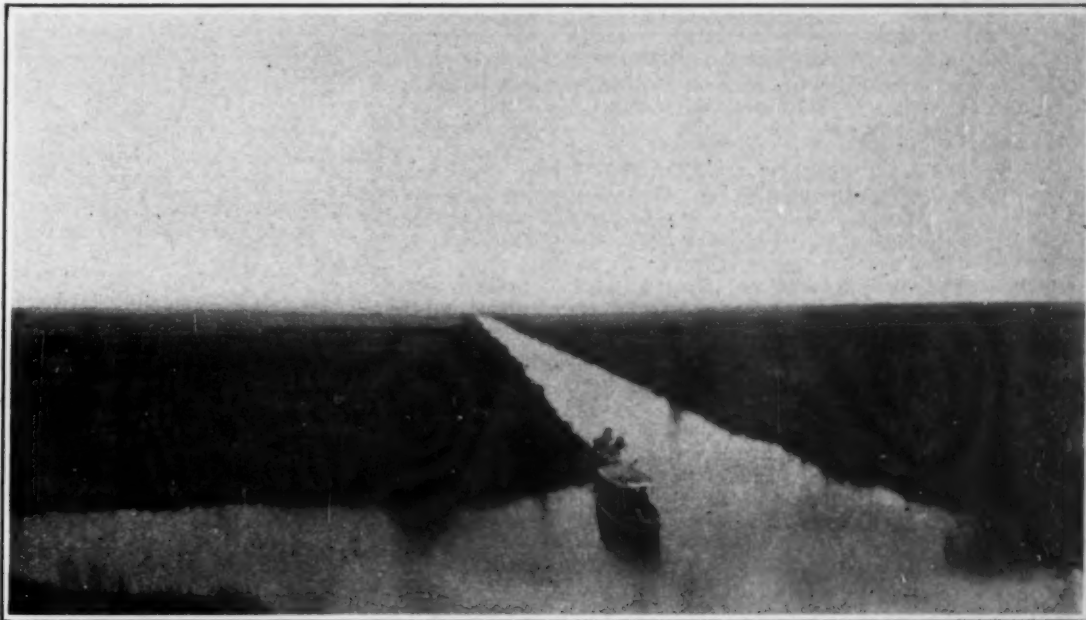


DIPPER DREDGE DIGGING DRAINAGE CANAL.

field ditches, all connected together to a main reservoir canal on which is placed a pumping plant to remove the excess rainfall from within the levees to the outside or navigable waters connecting with the Gulf. Both reservoir system and pumping plant should be designed of sufficient capacity to take care of the runoff from the heaviest rainfall before injury can result to crops growing on such land.

"So far the work that has been accomplished has been done largely by private capital and private enterprises. The Louisiana Legislature at its last session passed a most excellent drainage law providing for the organization of drainage districts and the issuing of long-time bonds to provide funds to carry out the work. This will, in the future, be a great aid in developing this country. A bill is before Congress at the present time providing for Federal aid. The drainage of four million acres of uninhabited swamp area is a herculean task, and because of its great importance, if there is a way that the Government can render aid in this work, it should be done. If it could spend hundreds of millions in the reclamation of a desert, why should it not aid in draining and making fit for habitation this, the richest body of agricultural land in the world? This area has a greater supporting capacity than any other equal area occupied by the white race. The popula-

States, and it will thus be seen that with the excellent transportation facilities that exist the market conditions will always be the best. And,



A FINISHED CANAL CUT PREPARATORY TO DRAINING LANDS OF THE DELTA LANDS CO., PARADIS.



THIRD STAGE IN THE PROGRESS OF RECLAMATION WORK.

Town building where water meets the rail at Paradis. Navigable canal gives water transportation to New Orleans, while main line of Southern Pacific is on the left.

tion of the Acadian settlement occupying the front lands of Bayou La Fourche is 362 to the square mile for the cultivated area and is rapidly increasing. Along this bayou is a street 65 miles in length, with an average distance between the homes of less than 200 feet. This reclaimed land will support a greater population than the low lands of Holland or the fens of England. The reclamation of many thousands of acres has already been completed. As in Holland and in the fens of England, the reclaimed tracts are traversed everywhere by canals. The farmers occupying these lands control their own transportation; the transportation does not control them. There is already within the State of Louisiana nearly 5000 miles of navigable waters, and the reclamation of the lower delta will add to this at least 2500 miles more.

"As the crow flies the city of New Orleans is located but 500 miles from the center of population of the United States, and it will thus be seen that with the excellent transportation facilities that exist the market conditions will always be the best. And,

again, the city of New Orleans, with a population of 350,000 inhabitants, is already the second port of entry in the United States, and its important export trade is increasing with notable rapidity. The opening of the Panama Canal is not only going to add materially to this foreign trade, but is going to exert a wonderful influence on the development of the city and the surrounding country.

"In 1804 President Thomas Jefferson said that New Orleans was destined to become one of the largest cities of the world. It surely occupies the geographical position to become a great and prosperous city. The development of the contiguous swamp area will add immensely to its development and prosperity. There are in the lower delta upwards of 5500 square miles of reclaimable lands, lands that will within a reasonable time be reclaimed. On the basis of the present population in the La Fourche country, this area will have a population of more than 2,000,000 prosperous, thrifty people, and on the basis of the population of Holland it will be upwards of 5,000,000, and the product of these lands annually will be of greater value than the total output of gold in California since its discovery at Sutter's Mill in '49."

As indicating the plans and scope of operation of some of the companies



engaged in drainage work, a somewhat detailed description is herewith given of typical enterprises under way in Southern Louisiana.

#### EDWARD WISNER AND LOUISIANA MEADOWS CO.

Edward Wisner, universally acclaimed as the Father of Drainage in Louisiana, with an ownership of wet lands running into millions in value, has had the usual experience of the pioneer in any field, in that for years he stood alone the almost solitary champion of a cause in which he believed. A banker in Michigan, he came south for his health, which he found. From Northern Louisiana he removed to New Orleans, and with the then firm of Wisner & Dresser began the purchase of so-called swamp lands in 1900. Of such little value were any of these lands then regarded that he was able to



BUILDING SHELL ROADS.

The shells are barged in from the sea and make roads that are second to none in the United States.

secure thousands of acres from levee boards, in whom title had been vested by the United States Government in the fifties at 12½ cents an acre. Nobody wanted the lands at any price at that time, and sales were considered well made by the State at 12½ cents an acre. After subsequent purchases at 25 cents, the members of the board began to feel that Wisner ought to be restrained by a legal guardian from squandering his means.

Still keeping up his purchases, the authorities became finally convinced that he must have some definite purpose in mind and concluded that the State would do well to refuse further dealings with him, and they declined to ratify any more sales in which his name appeared as intending purchaser. In the aggregate, his holdings amounted at the maximum period to 1,300,000 acres.

Wisner from the first foresaw the possibilities of drainage, but it was not till 1906 that steps were first taken for artificial drainage through canals, reservoirs, ditches and pumping plants.

Lands along the ridges, requiring only gravity drainage, were sold from time to time, and the proceeds used to ditch, levee and drain the first unit of 1000 acres on the Raceland prairies.

A second unit of 1000 acres was likewise drained and settlers were induced to locate.

At that time there was no precedent for guidance. There had been some reclamation of swamp lands, but only of wet lands adjacent to "front land" ownership. Nobody had gone onto the "trembling prairies" to drain and prepare them for the plow, and skepticism was rampant. There were no engineers who felt qualified to point the way—none who knew more of the problem than did Wisner himself.

Prospective purchasers asked who had lived on these reclaimed swamp lands, and finding that it was an untried experiment, it was possible to secure only those who had nowhere else to go—many of those making the experiment doing so only on the basis of pay for locating and working on the lands.

It was subsequently found that the levees, canals, ditches, reservoirs and pumping plants, which were modeled after those in use by the natives for semi-drained lands, were inadequate for complete drainage, and when a third unit was created advantage was taken of the experience had, and deeper ditches, more capacious canals and reservoirs and more adequate and modern pumping plants were installed. By these means complete drainage was secured and there are farms in this district where the water table has been reduced to six feet below the surface of the ground, as in the city of New Orleans.

Among the venturesome ones who went where no human being had ever lived before, there were some who remained and made good; others went away.

The earlier developments will now be gone over, and with a more adequate drainage system conditions will invite the stable permanent settlers like those who have located and stayed on the later developed tracts.

Today at Raceland there are about sixty white families, mostly from the North, who own their own land, a good part of whom have fully paid for their lands, and all of them as permanently located as are farmers anywhere. Some have made big returns on their crops, and based on calculations in vogue in Illinois and other Northern States, of reaching valuations of lands through the value of crops produced, these lands have an intrinsic worth of \$250 to \$500 an acre today.

The Wisner interests now have about 4500 acres completely drained and under cultivation in the Raceland district, with 15,000 additional in the same locality on which work is being done with the expectation that it will all be ready for cultivation within the next two years.

About the time the third district work was inaugurated an experiment

was made near Lockport of reclaiming a tract of 750 acres from the bottom of a lake—Lake Fields. Together with an old friend, A. V. Smith, also from Michigan, a partnership was formed by Wisner for the development of this property. Smith invested all he had left from a disastrous business experience, \$1800, and Wisner agreed to advance whatever was necessary to complete the work beyond this sum. From first to last \$18,000 was advanced by him. The work began in 1908, was eminently successful from the start, the land becoming friable and ready for the plow almost immediately after the leveeing and drainage, and a sugar plantation was established, the place now being known as "Smithport." Houses, tenements and buildings have been constructed, the place brought to a high state of cultivation and efficiency, and last year a net return of \$20,000 was secured from the crops and stock raised on this 750-acre farm. Smith had had no previous farming experience, being simply a practical man of affairs.

In 1907 the firm of Wisner & Dresser was dissolved, and Wisner took over the ownership of the wet lands the firm had acquired.

Needing an organization to handle projects, A. B. Graves, then in a bank in Michigan, was induced to handle the finances of the concern, and later Allen T. Dusenbury, also of Michigan, an engineer and land title man, was secured to look after outside physical affairs.

The Louisiana Meadows Co. was subsequently formed with Wisner as president, Dusenbury as vice-president and Graves as secretary and treasurer. This company took over all the Wisner holdings. After the manner of Carnegie, the young men were given an incentive to the greatest possible activity by having an interest in the business settled on them. The work they have done has resulted in the greatest possible enhancement in the values of the company's holdings, so that their prospects for also getting into the millionaire class are excellent, and today the company owns lands in the parishes of St. Charles, Lafourche, Terrebonne, Plaquemine, St. Bernard, Jefferson and St. John Baptiste.

In addition to the drained acreages at Raceland and Lockport, the company has 5000 acres on Bayou Barataria, which has all been ditched and prepared for drainage and on which a pumping plant is being installed.

Wisner, Graves and Dusenbury also own a 4000-acre tract on Bayou Des Allemands, which is largely drained and which they will cultivate themselves.

Also a dozen or so of the most important companies operating today in the vicinity of New Orleans, on drainage projects, are working on lands originally included in the Wisner holdings, while the present Wisner ownerships are still the dominating factor in the wet lands situation here.

#### THE WHITE LAKE LAND CO.

One of the best demonstrations of the practicability and value of the so-called reclamation of the marsh lands of Southern Louisiana is found about one hundred and seventy miles west of New Orleans, in Vermilion parish. This is the property of the White Lake Land Co., a Michigan corporation, of which Mr. A. L. Arpin is president, deriving its name from the fact that the 80,000 acres comprising the holdings of the company lie immediately north of the body of water designated on the maps as White Lake.

These eighty thousand acres offer an ideal opportunity for the reclamationist, in that they are a broad, level stretch of almost treeless prairie—so



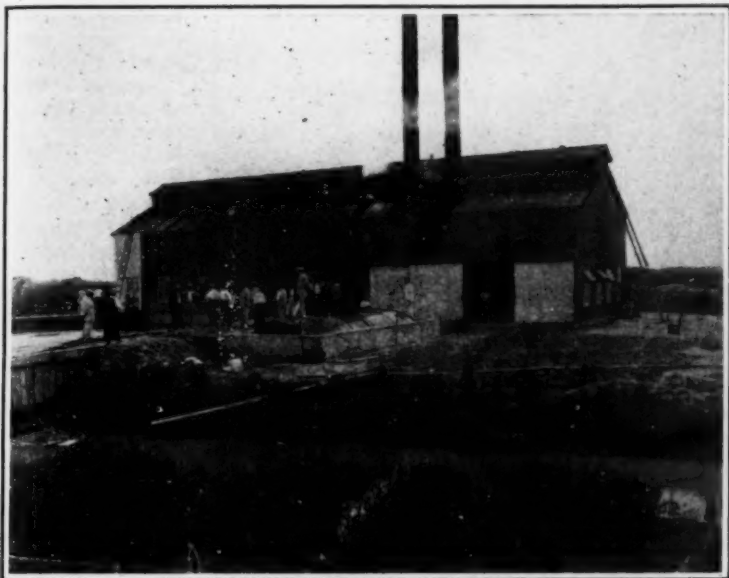
A WELL-BUILT SHELL ROAD IN ST. BERNARD PARISH (COUNTY).

level that the heavy annual rainfall of this vicinity cannot readily make its way to natural outlets; and, because of this, water in varying depth stands for the greater part of the year. Because it is level, on the other hand, and free from stumps, stone, rock or other hindering substance, the work of the big dredge boats is simplified and cheapened as compared with those regions in which such obstructions are encountered. Again, the tract forming an almost perfect parallelogram some twelve miles in width by fourteen miles in length, offers the engineer no problem beyond simple geometric lines; it may be and is, so far as the survey has progressed, laid off with the simplicity of a checker-board.

The White Lake Land Co. began its operations upon this tract something like two years ago, at which time its first unit of 5700 acres was platted, following the organization of a drainage district under the laws of the State by which bonds were issued and a tax levied to provide funds for their repayment. This first unit consists of an almost perfect square, around which has been thrown a levee, thus fortifying the unit against the encroachment of water from without. Inside the levee there was then, by the use of heavy machinery designed for the purpose, established a system of canals and

ditches by which the water is accumulated in the larger of the canals; whence, by the use of centrifugal pumps, it is lifted from the interior to the exterior of the surrounding levees, there to disappear by evaporation or by slow dissipation into water courses leading to White Lake.

Nothing could be simpler than this method of drainage, from an engineering standpoint, and it would seem that even the layman at his first observation would be convinced of its soundness in theory and practice—as, indeed, he usually is. But it is an expensive proposition. It is quite easy to say that a levee has been built, that canals and ditches have been dug, and that pumps have been installed, but the expenditure of time, labor and money upon the undertaking is a thing of no mean proportions. In the first place, the levee surrounds approximately nine sections of 640 acres each, or 5760 acres, in a



STEEL AND CONCRETE PUMPING PLANT ON PROPERTY OF WHITE LAKE LAND CO.

square having four sides each three miles in length—twelve miles or so in all. The levee has an average base of perhaps thirty feet and an average height of between four and five feet. Then there are between twenty-five and thirty miles of canals, ranging in width from twenty-five to fifty feet and in depth from six to ten feet. Again, connecting these canals, is a network of lateral ditches many miles in length. All this means work, and lots of it, and money, and lots of it, and time, and lots of it. In addition to this part of the design came the pumping facilities. Located in the southeast corner of the square as described is the pumping plant. It is said to be the largest plant of this character devoted to drainage in the South. It has a capacity of 220,000 gallons per minute. That is its maximum. It will seldom or never be fully used. In truth, it is only under extraordinary circumstances that the pump will be called upon at all. Under normal conditions the system of ditches and canals takes care of the drainage of this unit of land without the assistance of the pumps to remove the water from within the barricade. Evaporation and absorption and the natural flow ordinarily take care of the water that before the installation of the system was surplus. But there are times when the rainfall in this section reaches as much as eight inches during twenty-four hours. And it is at these times that the pump is necessary. It is an emergency provision. By it, too, in the possible event that rainfall is deficient, the unit, or polder (by which name the square of drained land would be known were it located in Holland, the home of "reclamation," so to speak) could be adequately supplied with moisture—irrigated in the most modern and approved way.

During March of 1912 the system of drainage as here outlined was completed, and the test of its practical operation was made. It had been a general opinion—it must be understood that drainage of large bodies of Southern Louisiana land was still largely a matter of theory rather than practical exemplification—that within thirty days of the starting of the big pumps on this unit the big traction plows and pulverizers of soil could be started and that a first crop of corn could be planted that season. But not many days elapsed before it was well understood that a longer time would be required to remove the moisture from about the grassroots, which served as a sort of sponge, than had been reckoned. Consequently, only a small portion of the land was put to crop during 1912.

In the meantime a demand for the land had been created among the Northern homeseekers, hundreds of whom had accepted the invitation to come upon the ground and make personal inspection and investigation of the proposition. From Indiana, Iowa, Illinois, Missouri, Minnesota, Nebraska—especially Nebraska—came the visitors. A very large proportion of them, immediately impressed with the prodigality of nature in the way of fertile soil, delightful climate and unlimited opportunity, became purchasers of parcels of land, and it was not long before every acre of this first unit of 5700 acres had passed into the ownership of these energetic and ambitious Northerners, the majority of whom contemplated immediate settlement upon the land and its improvement. There has been some unlooked for delay in this respect, as intimated, but today, where less than twenty months ago was a barren, unsightly, unproductive marsh—repellant from every aspect—there has sprung up an active village (Florence), surrounded by new farms upon which nearly one hundred families are working out their destinies.

Even before the first unit of 5700 acres was "reclaimed," the White Lake

Land Co. began operations upon a second unit of 2600 acres adjoining. The same engineering problems were met with, and the same work along the same general lines was put upon this unit, the result being that during the fall of 1912 it, too, was ready for the occupancy of the buyers from the North who had already become its owners. And a third unit of 5000 acres commanded the attention of these energetic reclamationists. This, too, has made considerable progress, and will shortly have passed through the various stages from wet lands to cultivated farms as have the tracts referred to.

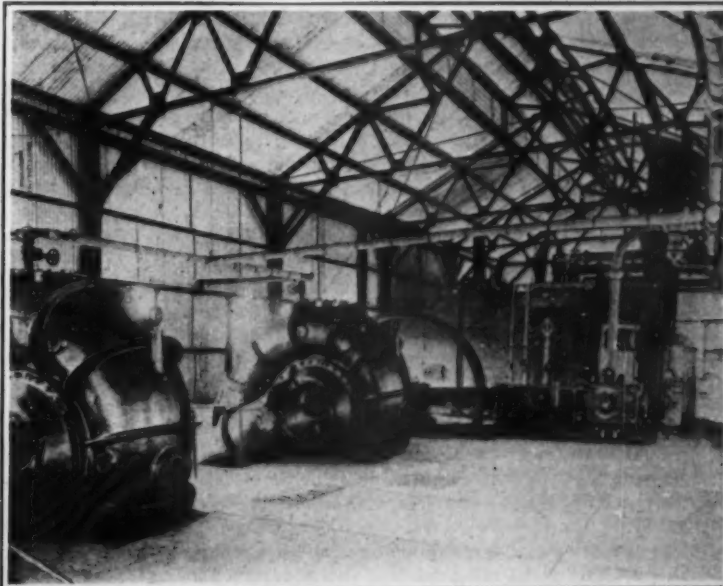
This, then, is the present status of the business of the White Lake Land Co. in Vermilion parish: 5700 acres have been drained and are now being cultivated, upon a portion of which crops were grown for the first time in history during 1912 and upon all of which crops will be growing this season; 2600 acres are almost ready for the plow, and the larger portion, if not all of it, will be in cultivation during 1913; 5000 additional acres will have been drained and made ready for the plow by the beginning of the season of 1914. Of this, the greater acreage has already been sold. Indeed, the demand for the land is so far in excess of the supply that eighteen months or two years will be required for the reclamation end of the business to catch up with the selling end.

Finally, the demonstration here may be said to include the practicability, the feasibility of drainage as planned; the possibility of its profitable cultivation (there never has been a question of the fertility of the soil); the possibility of its disposal to Northern farmers and its perfect adaptability to their uses.

The White Lake project is the largest private enterprise of its kind in the South. Its inauguration at a time when the public was more than skeptical upon the subject of drainage as applied to the marshes of Southern Louisiana demanded from its inspirators more than ordinary business nerve and daring, but by adhering closely to its original plans as made by able and successful engineers, while readily adapting itself to emergencies and unlooked-for contingencies as they arose, and the readiness and ability to meet the heavy expenditures of money involved, the project has become of nation-wide fame and is one of the show-places of the State to which the home-seeker from the North quite naturally gravitates when seeking information concerning the wonderful resources of this part of the South, and confirmation therein. Best of all, it stands up handsomely under any test that may be applied, and it is certain that in the time to come, when all the submerged area of the State shall have been drained and made mightily fruitful, the White Lake Land Co. will occupy that enviable position universally and deservedly given the pioneers and leaders at the head of any movement inherently great in the benefits it may confer upon the human family.

#### LOUISIANA DELTA LANDS CO.

A very notable development is that of the Louisiana Delta Lands Co., owner of the Paradis tract. The lands of this company, some 19,000 acres in extent, are in St. Charles parish, beginning about 27 miles from New Orleans and fronting on the main line of the Southern Pacific Railroad. The officers of the company are: J. Lahroy Slusher, president; Julius F. Funk, vice-president and treasurer; Henry L. Favrot, secretary.



INSIDE VIEW OF PUMPING PLANT OF WHITE LAKE LAND CO., SHOWING CENTRIFUGAL TYPE OF PUMP IN GENERAL USE FOR DRAINAGE PLANTS.

Vim and vigor have marked the operations of this company from the beginning. President Slusher is a thorough land man; Mr. Funk is one of the Bloomington, Ill., Funks, who are among the most famous and successful corn growers in the world, and Mr. Favrot is a New Orleans attorney who has specialized on drainage matters, and was, as a member of the State Senate, instrumental in getting through the drainage bond law of 1910, the joint product of himself and Mr. R. E. Milling. Behind that company is ample means, and, with officers in New Orleans and Chicago, a selling force is kept at work that is producing remarkable results. Up to date over 6000 acres of the tract have been sold to Northern farmers in 40, 60 and 80-acre tracts. Twenty-five families were located on the property by Christmas, and 100 families are expected to be located by the first of May. Excursions of prospectors are brought down at



frequent intervals from the North, and an unusually high percentage of them become investors.

At the town of Paradis there has been built a commodious and comfortable hotel, a bank established and other improvements made. Mr. Funk has built him a home, and he and his family remain there a large part of the year. Mr. Slusher spends most of his time down there, so that all prospective purchasers are given the most complete personal attention and consideration.

With its many new homes and cultivated tracts, in full view from trains on the Southern Pacific, the development of Paradis makes a most favorable impression on the casual passerby as well as on those who stop for an inspection of the place. Highly remunerative truck farming is engaged in, and as New Orleans may be reached by railroad, automobile road or water route, the manifest destiny of these lands is to become an intensely cultivated farm garden, with an ultimate value on the land of hundreds of dollars an acre. All kinds of general farming operations are also engaged in here now, and cattle and hogs thrive wonderfully, running in the open all through the winter months and keeping in fine condition with little or no feeding at any time.

There are pecan groves on a portion of the tract, Louisiana being the home of the pecan, and some attention is being given to the raising of citrus fruits.

The advent of the Funk interests came about through a notable excursion made to Southern Louisiana in the summer of 1910. David Rankin, the great Missouri corn grower; three of the Funk brothers of Bloomington, Ill.; farmers, soil experts, agricultural college professors, and chemists and capitalists from Illinois, Wisconsin, Iowa and elsewhere were brought here in a special car at the instance of Edward Wisner and taken out to the reclaimed lands at Raceland, Lockport and elsewhere, and also to some of the orange groves on the river "front lands." Exhaustive soil tests were made, and investigations as to conditions of all kinds, including health, and formal reports were made by the experts and others. At one place a field of corn was shown that had been sown broadcast following a stubble breaker, and never had been cultivated. The growth was so luxuriant that the corn had choked out grass and weeds, and on the rank stalks 8 to 12 feet high were well-filled ears that afterwards showed a yield of 65 bushels to the acre. David Rankin, up to the time of his death the greatest corn raiser in the country, having some 30,000 acres devoted entirely to corn, voiced his astonishment at what he had seen, declaring that in all his experience he had never found conditions such as these. If he were a young man, he said, he would want nothing better than to establish a corn farm in the Louisiana delta.

Mr. Julius F. Funk declared this trip was a revelation to him, and Mr. Dean Funk, president of the Funk Bros. Seed Co., Bloomington, Ill., declared: "In the Louisiana delta the Northern corn grower will find his Utopia. No soil in the world contains more of the elements essential to the maximum crop of corn." Mr. Eugene D. Funk, president of the National Corn Growers' Association, said "an average corn crop in the delta country of Louisiana should be 100 bushels per acre."

Mr. F. G. Baer, chief chemist of the Ohio State University, reported that there is enough nitrogen in the first eight inches of this soil to supply fertilizer for one thousand 50-bushel crops of corn.

Prof. F. S. Klinck, Iowa Agricultural College, reported: "The range and excellence of the crops, both agricultural and horticultural, is the strongest possible evidence of the adaptability of these reclaimed areas for agricultural purposes."

Corn growing and stock raising, with which the visitors were most familiar, were declared to be two lines of activity in which remarkably lucrative returns could be counted on with anything like the attention given to them that is done in the North. That Louisiana has peculiar advantages as a corn State has been demonstrated by the fact that corn matures early here, and, being thoroughly sun dried, contains only 12 to 15 per cent. of water when ready for market, making it the driest corn grown anywhere in the United States. Its phenomenal dryness gives it unusual keeping qualities and especially fits it for export purposes.

Investigation as to climate and health conditions showed that since the discovery that yellow fever is disseminated solely by the stegomya mosquito, and science having also learned how to handle and prevent other subtropical fevers, and along with improved conditions that come with extensive drainage operations, the healthfulness of Louisiana is greater than in many other parts of the country much farther to the north. Weather Bureau reports also showed

that most erroneous ideas prevailed about the heat. While the whole North, even as far up as interior Canada, sometimes swelters in 100 to 115-degree weather, lower Louisiana almost never experiences a higher temperature than 95, and even in July the maximum may run under 90 for days at a time, with always a refreshing breeze from the Gulf.

Proximity to the Gulf tempers the heat of summer as well as the cold of winter.

Finding conditions so favorable in every way, negotiations were shortly entered into by the Funks for the purchase of a tract, and the well-located site at Paradis was bought from Messrs. Wisner and Crawford, and drainage work, already undertaken, was extended. It is the purpose of the Louisiana Delta Lands Co. to so completely drain and protect their entire holdings that no

combination of floods or crevasse can ever again menace them.

Additional acreages have been secured since the initial purchase. They, too, will be thoroughly prepared for cultivation, and so enthusiastic are the members of the company that arrangements for further operations are likely to be made.

R. H. & G. A.  
McWILLIAMS.

Credit for the important part of a pioneer in dredging operations in Louisiana is due Mr. G. A. McWilliams of the contracting firm of R. H. & G. A. McWilliams of Walnut, Ill. Although still a young

man, Mr. McWilliams had been for many years prominently identified with drainage projects in various parts of the country from Wisconsin and Michigan down through the Mississippi Valley as far as Southern Illinois. Through information supplied by the Manufacturers Record, Mr. McWilliams began investigations as to conditions in Louisiana during the summer of 1908. In 1909 O. W. Crawford spent several weeks with Mr. McWilliams at his home in Walnut, with the result that Mr. McWilliams came to Louisiana shortly afterwards and devoted some time to the investigation of conditions here. The result of this visit was a contract entered into between Mr. McWilliams and the Truck Farm Land Co., one of the Wisner companies, by which a considerable tract of land was to be drained in St. Charles parish, and the cost paid for in wet lands, also in St. Charles parish. Subsequently, Mr. McWilliams added to his holdings further large acreages by purchase, so that at the present time he owns 13,800 acres of choice lands in a compact body in St. Charles parish. Much of this tract has been ditched and partly drained, and will unquestionably be ultimately fully developed and occupied by farmers and truck-growers from the North. Mr. McWilliams has expended something like \$100,000 in improving the tract and making the initial developments required to put the large holding in complete shape for cultivation.

GEORGE A. HERO.

Nothing could more forcibly demonstrate the newness of the reclamation or drainage movement than the fact that only just now has a district been organized, which embraces territory immediately across the river from New Orleans. Included in the district are the cities of Algiers and Goudsboro in New Orleans parish, and McDonoughville, Mechanicham, Gretna and the settlement at the head of the Harvey Canal in Jefferson parish, but this district also takes in 26,200 acres of undrained and uncultivated back lands, comprising all the territory south and west of the Mississippi River, back to the Harvey Canal and Bayou Barataria, and south to a line produced from Bayou Barataria southeast to the Mississippi River, a distance south of Algiers of about 10 miles. The simplicity of the drainage problems, the proximity to New Orleans, with every sort of rail and water transportation and the great fertility of the soil justify the comment of Mr. J. F. Coleman, consulting engineer, that it is hard to understand why the enterprise was not carried out long ago.

Nevertheless it has taken some right hard work to put the undertaking on its feet. The moving spirit in the enterprise is Mr. George A. Hero, 309 Cotton Exchange Building, New Orleans, who is president of the Jefferson-Plaquemines Drainage District that has been formed, as provided by law, to do the work of drainage. When the project was finally whipped into shape the possibilities and advantages became so apparent that the \$250,000 bond issue required for drainage work was readily sold to Northern land buyers—the First National Bank of Columbus, O., which has also taken over the Bayou Cane Land Co.'s issue of \$142,000.

The lands within the district are especially favored for drainage; they are almost surrounded by the Mississippi levees, and need levees for only a short stretch along Harvey's Canal and from thence to the Mississippi River at the lower line of the Cedar Grove Plantation, the southern boundary of the dis-



NORTHERN INVESTORS ON RECLAIMED LANDS, NOVEMBER, 1912. "HURRAH FOR LOUISIANA."

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The Continental Trust Company

BALTIMORE

S. DAVIES WARFIELD, President

## The First National Bank

OF RICHMOND, VA.

Capital, - - - \$ 2,000,000  
Surplus, - - - 1,000,000  
Deposits, - - - 14,000,000  
Resources, - - 20,000,000

WM. M. HABLSTON, Chairman of the Board  
JNO. B. PURCELL, President  
JNO. M. MILLER, Jr., Vice-President  
W. M. ADDISON, Cashier

ESTABLISHED 1865

## MARYLAND TRUST COMPANY BALTIMORE, MD.

### Statement of Condition at Close of Business December 31, 1912

ASSETS.		LIABILITIES AND CAPITAL.	
Cash on Deposit and in Hand.....	\$206,873.88	Deposits:	
Due from Banks and Bankers.....	93,029.26	Individual .....	\$1,054,923.02
Loans on Collateral:		Banks .....	110,141.64
Demand .....	\$1,215,255.89	Savings .....	21,151.58
Time .....	71,181.26	Trust Accounts.....	454,857.93
	1,286,437.15		\$1,641,074.17
Other Current Assets.....	41,472.21	Certified Checks.....	125.18
Investments:		Total Liabilities.....	\$1,641,199.35
Sundry Bonds, Stocks, Syndicate Participations, etc.....	\$1,135,019.05	Excess of Assets over Liabilities represented by:	
City of Baltimore 3½ per cent. Stock....	296,484.00	Undivided Profits....	\$445,116.20
Maryland Trust Building Co., entire Bonds and Stock..	525,000.00	Preferred Capital Stock .....	500,000.00
	1,956,503.05	Common Capital Stock .....	1,000,000.00
Office Furniture and Fixtures.....	2,000.00		1,945,116.20
Total Assets.....	\$3,586,315.55	NOTE:	
		Undivided Profits before Dividend.....	\$475,116.20
		Less Dividends on Preferred Stock paid during year..	30,000.00
		Balance of Undivided Profits, as above....	\$445,116.20
		Total Liabilities and Capital..	\$3,586,315.55

Accounts Solicited.  
Interest allowed on Deposits Subject to Check.  
Special Rates on Certificates of Deposit.  
Safe Deposit Boxes for Rent.  
Acts as Trustee under Railroad and other Mortgages, and as Agent for the Transfer and Registration of Stocks and Bonds.  
A Legal Depository for Court and Trust Funds.  
Transacts a General Trust and Banking Business.

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OSCAR G. MURRAY, 1st Vice-President.  
CARROLL VAN NESS, 2d Vice-President.  
JERVIS SPENCER, JR., Sec. and Treas.  
IVAN SKINNER, { Assistant Secretary,  
Assistant Treasurer.

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Joseph I. France, Baltimore.  
\*Robert Garrett, Baltimore.  
Rufus M. Gibbs, Baltimore.  
\*B. Howell Griswold, Jr., Baltimore.  
George Garr Henry, New York.  
A. Barton Hepburn, New York.  
John T. Hill, Baltimore.  
\*George C. Jenkins, Baltimore.  
\*J. V. McNeal, Baltimore.  
L. S. Zimmerman, Baltimore.  
\*Members Executive Committee.

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Henry C. Matthews, Baltimore.  
C. Wilbur Miller, Baltimore.  
\*Oscar G. Murray, Baltimore.  
James L. Selman, Baltimore.  
\*John T. Stone, Baltimore.  
Theodore E. Straus, Baltimore.  
Arthur G. Wellington, Baltimore.  
\*Henry B. Wilcox, Baltimore.  
Douglas M. Wylie, Baltimore.

We have examined the books and accounts of the Maryland Trust Company, and WE HEREBY CERTIFY that the above statement correctly sets forth the Company's condition at the close of business on December 31, 1912.  
New York, January 18, 1913.

(Signed) HASKINS & SELLS, Certified Public Accountants.



# The Palmetto National Bank

of

## COLUMBIA, S. C.

THE CENTRAL CITY OF  
THE CENTRAL SOUTH  
ATLANTIC STATE



THE 1913 HOME  
of  
THE PALMETTO NATIONAL BANK

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Capital  
\$250,000.00

Surplus and Profits  
\$150,000.00

Deposits  
\$2,700,000.00

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### OFFICERS

WILIE JONES, President  
JOHN JACOB SEIBELS, Vice-President  
THOMAS TAYLOR, 2nd Vice-President  
J. P. MATTHEWS, Cashier  
WM. M. GIBBES, JR., Asst. Cashier  
WESTON & AYCOCK, Solicitors

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STATE, CITY AND COUNTY DEPOSITORY

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Georgia is the King Pin of the South's Progress, and the Big Ben of Her Awakening.

Georgia stands in the front rank with her wise and conservative legislation, guaranteeing protection to all legitimately invested capital.

This Bank can help you get in closer touch with Georgia and the South.

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ALLEN M. SCHOEN Vice-President	HENRY W. TODD Assistant Cashier

**TRAVELERS BANK & TRUST COMPANY**  
Peachtree and Walton Sts. Branch—297 Marietta St.  
Atlanta, Georgia

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TOM O. SMITH, Vice-President  
W. H. MANLY, Cashier

BENBON CAIN, Asst. Cashier  
C. D. COTTEN, Asst. Cashier  
E. W. FINCH, Asst. Cashier

## Birmingham Trust and Savings Company

Capital, . . . . \$500,000.00  
Surplus, . . . . 550,000.00

BIRMINGHAM, ALABAMA

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TOM O. SMITH, Vice-President.	R. S. MUNGER, Director Continental Gin Co.
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LEE C. BRADLEY, Attorney at Law.	H. J. PORTER, Pres. of Porter Clothing Co.
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S. L. EARLE, of Earle Bros. Merchants.	R. A. TERRELL, Pres. Bank of Alabama, Ensley, Ala.
WILLIAM I. GRUBB, U. S. District Judge.	WILLIAM WOODWARD, Pres. Hanover National Bank, New York.
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RICHMOND, VA.

CAPITAL ONE MILLION DOLLARS

The Oldest Trust Company in the Old Dominion

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L. D. AYLETT, Secretary  
JNO. H. SOUTHWALL, Treasurer

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JAMES N. BOYD President Planters National Bank Richmond	SAMUEL T. MORGAN President Virginia-Carolina Chemical Company
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JOHN L. WINGO, Leaf Tobacco	

CAPITAL, SURPLUS AND PROFITS, \$791,000.00



SAVANNAH, GEORGIA

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*The*  
**Heard National Bank**  
 JACKSONVILLE,  
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Capital, . . . .	\$1,000,000.00
Surplus, . . . .	250,000.00

OFFICERS

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W. B. SADLER, Vice-President

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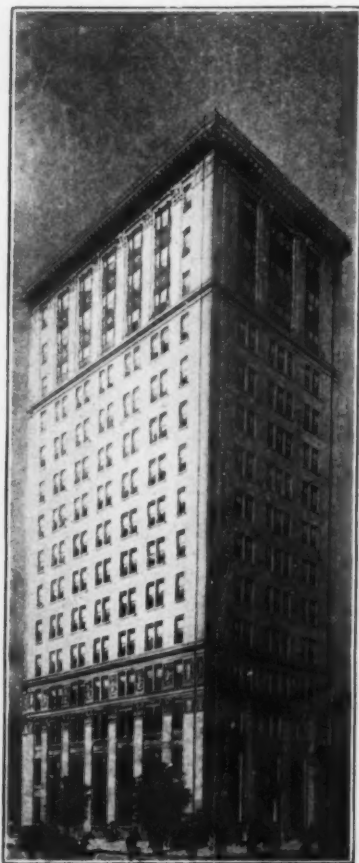
CHAS. G. BELL, Vice-President

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E. M. NICHOLS, Asst. Cashier

**An Active Force in the South's Upbuilding**



# THE MERCHANTS NATIONAL BANK OF SAVANNAH

Established 1866

United States Depository



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V. B. JENKINS,  
Assistant Cashier

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J. F. Minis  
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We are constantly in the market, with a two-fold service:

TO THE INVESTOR, we offer the facilities of a peculiarly well-equipped organization, able to supply him with the very "cream" of investment offerings.

TO THOSE SEEKING CAPITAL, either to handle immediate needs to, or extensions of, existing properties, we offer ready co-operation.

How may we best serve YOU? Write us freely and frankly, that we may offer our facilities in either of the above divisions to YOU.

"A Record of Investments" will interest every holder of bonds.  
Sent on request.

**D. ARTHUR BOWMAN & COMPANY**  
Investment Bankers

Third National Bank Building SAINT LOUIS, MISSOURI

L. J. COOPER, Pres. S. H. EVERETT, Cashier JUDGE J. S. WILLIAMS, V.-Pres.

**WAYCROSS SAVINGS AND TRUST CO.**  
WAYCROSS, GA.

Capital and Profits, - - - \$175,000

**6%** PAID ON SAVINGS DEPOSITS.  
Coupon Certificates issued, interest payable quarterly in four detachable Coupons  
ALL LOANS SECURED BY REAL ESTATE ON A 3 TO 1 BASIS

### Texas Farm Mortgages are Excelled by None

For adequate safety and security with substantial dividend yield. For—17—years we have been making farm loans in North Central Texas, and have never had a suit or foreclosure, and have now no past interest due, which is certainly evidence of our ability and success in safeguarding the interests of our clients.

THE MOST CONSERVATIVE  
Life Insurance Companies in the Union invest in our North Central Texas Farm Mortgages. Write for booklet showing the REASON our farm mortgages are safer than bonds, yield larger dividends, and why you should buy them.

**A. Y. CREAGER CO., Farm Loans**  
SHERMAN, TEXAS

**6%** When you purchase from us a mortgage on Improved Georgia City or Farm Property you take as little chance as is humanly possible. You receive from 6% to 7%, and you can be sure of receiving it regularly. Your principal is amply protected. Let us send you our list of Loans and some very reliable literature.  
**SESSIONS LOAN & TRUST CO.**  
MARIETTA, GA.

### OPPORTUNITY FOR PRACTICAL FOUNDRYMAN

with \$10,000 to invest as working capital in a well located and equipped foundry and machine plant now in successful operation at Johnson City, 10,000 population. Only plant serving a large and prosperous territory.

Only practical man with first-class references desired.  
S. C. WILLIAMS JOHNSON CITY, TENN.

### PAGE & TAYLOR

REAL ESTATE BROKERS

Factory Sites with Deep Water and Belt Line Connections  
303-304 Arcade Building, - - - NORFOLK, VA.

## MONEY TO LOAN On Downtown Business Properties

IN CITIES HAVING A POPULATION OF 30,000 OR OVER

¶ We will finance that new building for you on our *serial payment* plan. By this plan the loan is repaid in annual installments.

¶ If you contemplate erecting a new building or refunding an existing loan on business property, get in touch with us. Correspondence and interviews invited. Address

REAL ESTATE LOAN DEPARTMENT

**MERCANTILE TRUST COMPANY, - - - Saint Louis, Missouri**  
Capital and Surplus - \$9,500,000

FESTUS J. WADE, President

J. B. MOBERLY, Real Estate Loan Officer

## COOKE, HOLTZ & CO.

### INVESTMENT SECURITIES

H. T. HOLTZ, President  
ANDREW COOKE, Vice-President  
CHAS. HOWELLS COFFIN, Secretary  
JOSEPH W. GRAY, Treasurer

Incorporated  
Cash Capital \$500,000

We purchase entire issues of Public Utility Corporation Bonds and Debentures, in amounts of \$500,000 and upwards, issued by well-established properties, serving prosperous and growing communities; also entire issues of Municipal Bonds of Counties, Cities, Towns, School Districts and Drainage Districts.

We invite correspondence with Bankers, Dealers, or Operators of Public Utility Corporation properties with reference to the financing or sale of such properties.

#### WE OWN AND OFFER

an attractive selection of Municipal and Public Utility Corporation Bonds yielding from 4½% to 6%, suitable for the investment of the funds of Estates, Banks, Institutions and Private Investors.

Descriptive Circulars Sent on Request

39 South LaSalle Street

CHICAGO, ILLINOIS

## ASSETS REALIZATION COMPANY

---

Capital and Surplus, \$11,000,000

---

Finances established enterprises handicapped by inadequate capital. Buys short term bond issues on operating properties. Special facilities for investigation and supervision anywhere in United States.

—  
[CORRESPONDENCE INVITED]  
—

25 BROAD STREET  
New York

LAFAYETTE BLDG.  
Philadelphia

FIRST NATIONAL BANK BLDG.  
Chicago

## WE BUY MUNICIPAL BONDS

City, Town, County, School  
Road or Drainage District from Muni-  
cipalities, Contractors or  
Attorneys

---

Our twenty years' experience insures  
prompt and efficient service

---

Cutter, May & Company  
THE ROOKERY CHICAGO



# Americans and Europeans Come to Alabama U. S. A.

## We Are Wide Open to the Immigration of the World

From 38,000 people to 180,000 humans in 10 years—245.04 per cent.—this is the record of Greater Birmingham, the fastest growing young city in all America.

The growth of Birmingham has not been from blue-sky boosters; in fact, the people of this great city have been too busy to shout and sing out their praises over the land. They have been and are at work from sunrise to sunset, content and knowing that they are laboring on ground that is priceless; land that contains untold millions in minerals; land that will yield under the plow bumper crops of foodstuffs that will feed all their people for all time to come.

There is a reason for Birmingham. It is the only place in America where iron, coal and flux are mined side by side in the same fields; hence Birmingham dictates the price of iron for the world.

Its coal is nearer to deep water than any other coal field in America.

Greater Birmingham and the district is destined to have a million people. Buy the bonds of the American Finance & Bond Co.; large or small, cash or on the installment plan; they are guaranteed and indorsed by the banks and leading business men of Alabama; they are the fruit of well-earned real estate advances; bought at ground-floor prices and raised to office buildings and improved farms. Transactions too large for a small individual, but not too large for a lot of small individuals whose money is pooled together and invested in safe and steady increasing real estate. Investments made by men who know their business, the same as an able banker knows his business. You make your deposit and we guarantee it by issuing you a Gold Bond, paying you 6 per cent. and an interest in the earnings of the company. You are not bothered in mak-

American Finance & Bond Co.



Birmingham, Ala., U. S. A.  
American Trust Bldg., Seventh Floor  
Principal Northern Offices  
Philadelphia Nat'l Bank Bldg.  
Philadelphia, Pa.

We are indorsed by the banks, railroads and business men of Alabama. Write us. See us. If we haven't got what you want, we will get it at a less price than anybody.

European immigration via Mobile after the opening of the Panama Canal. American immigration via Mobile and every border city or town in the State, where welcome and the big key hangs over every door.

Our slogan is "Be an American and live and trade in Alabama."

### American Finance & Bond Company

BIRMINGHAM, ALA.

ing your money earn you the interest; we do the bothering; you clip your coupons and cash them.

Central and other real estate in Alabama, property that has real tangible value, is our assets and our guarantee. We do not invest outside the State, but we receive orders for our bonds from everywhere.

We can invest millions for years to come because we know how to invest. Write us.

We live where we are first to welcome and last to say good-by to that great and growing tide of commerce and the immigration of both hemispheres.

We are on the real backbone of the real REAL ESTATE which has wealth untold or unconceived, so vast is its dimensions.

The language of every nation and country is spoken here. Contentment prevails, because there is work for everybody from everywhere at high wages. We are new, because we were recently discovered; hence we are making laws consistent for all Americans.

Join the army of Alabama landowners while good land is cheap. Lands we are selling at \$30 an acre planted yields \$200 an acre. We are the new Pittsburgh of the South and the new Birmingham of England.

Our port is Mobile, the Philadelphia of the South. Navigable rivers with good steamboats and recently-built railways with best passenger coaches supply Birmingham, the district and other inland cities of this great State of Alabama.

We have bought up some of the best old plantations of Old Alabama, and are cutting up some of them into little farms and new towns of New Alabama. Some lands we are selling in large tracts for developers of this country and Europe. Some of this land contains iron, coal, marble, timber, etc.; some all agricultural lands.



Principal Northern Offices  
Philadelphia Nat'l Bank Bldg.  
Philadelphia, Pa.

## High-Grade Investments

### WE OFFER, SUBJECT TO SALE:

- 75,000 North Carolina State 4s, due 1949-1950.
- 50,000 Southern Power Company 5s, due 1930.
- 30,000 First Mortgage Real Estate 6s, due 1922.
- 15,000 National Bank Stocks and Trust Company Stocks.
- 25,000 High-Grade 6 and 7 per cent. non-taxable preferred stocks.
- 250,000 Selected Southern Mill Stocks.
- 34,000 Improved Central Property, one block of Independence Square.
- 200,000 Improved Central Property.
- 19,000 Central Business Building Site.
- 30,000 Tryon Street Business Building Site.
- 12,500 Trade Street Business Building Site.
- 15,000 Trade Street Business Building Site.
- 45,000 Trade Street Business Building Site.
- 11,000 South College Street Business Building Site.
- 36,000 Tryon Street Business Building Site.
- 30,000 Suburban Acreage Tract within City Limits.
- 30,000 Suburban Acreage Tract adjoining Myers Park.
- 100,000 Improved Residence Properties in Charlotte.
- 250,000 Suburban Home Sites—Colonial, Piedmont, Wilmoore.

### F. C. ABBOTT & CO.

Everything in Real Estate

High-Grade Investments

Insurance in Strong Companies

1001-1002 Commercial National Bank Building

CHARLOTTE, N. C.

## John W. Dickey

### Southern Investment Securities

## Augusta - - Georgia

# The J. G. White Companies

## International Engineers Contractors, Financiers, Managers

---

### J. G. WHITE & COMPANY, INC.

Purchase, Finance and Develop Water Power, Gas, Electric Light, Steam, Electric Railway and Power Properties.

Public Utility Securities offered to Bankers.

---

### J. G. WHITE ENGINEERING CORPORATION

Design and Construct Hydro-Electric Plants and Transmissions, Central Stations, Steam and Electric Railroads, Pipe Lines, Gas Plants, Bridges and Water Works, Sewerage, Drainage and Irrigation Systems.

Engineering Reports, Physical Valuations and Appraisals.

Act as Purchasing and Forwarding Agents for Individuals, Contractors and Corporations.

---

### J. G. WHITE MANAGEMENT CORPORATION

Managers of Public Service and Industrial Corporations.

---

43 EXCHANGE PLACE, NEW YORK

Chicago

Manila

San Francisco

---

J. G. WHITE & COMPANY, Ltd.

9 CLOAK LANE, CANNON ST., LONDON, E. C.

PARA, BRAZIL; BUENOS AYRES, ARGENTINE; SANTIAGO, CHILI.



ORGANIZED 1871

# Life Insurance Company of Virginia,

HOME OFFICE:  
RICHMOND, VA.

J. G. WALKER, Pres. E. D. HARRIS, 1st Vice-Pres. W. L. T. ROGERSON, 2nd Vice-Pres. A. S. HURT, Secretary

OLDEST—LARGEST—STRONGEST Southern Life Insurance Company

It issues in its Ordinary Department the most liberal forms of Policies from \$1,000 to \$50,000 on the

## Non-Participating Plan

It issues Industrial Policies from \$8 to \$1,000, with premiums payable WEEKLY, on persons from two to seventy years of age.



NEW HOME OFFICE BUILDING.  
Owned and occupied exclusively by the Company.

Its Policies are clear and definite in their provisions, and their values are absolutely guaranteed.

Its history has been characterized by its liberal forms of Policies; its prompt settlement of Death Losses without litigation; its equitable dealing with its Policyholders; its strength of organization, and everything which contributes to the security and economy of Life Insurance.

Assets December 31, 1912.....	\$8,470,628 54
Liabilities December 31, 1912.....	6,992,626 35
Capital and Surplus December 31, 1912.....	1,478,002 19
Insurance in Force December 31, 1912.....	85,963,852 00
Total Payments to Policyholders since organization.....	12,986,813 35

Is Paying its Policyholders OVER \$1,000,000 Annually. All Claims Paid IMMEDIATELY Upon Receipt of Satisfactory Proofs of Death.

GOOD TERRITORY OPEN FOR LIVE AGENTS. Address

F. E. HALL, Superintendent Ordinary Agencies,

Home Office: Richmond, Va.

## 81st ANNUAL STATEMENT

OF

## Virginia Fire and Marine Insurance Company

RICHMOND, VA.

JANUARY 1st, 1913

### ASSETS

Stocks and bonds.....	\$1,296,567.75
Real estate owned by the company.....	70,958.44
Loans on bond and mortgage (first liens, value of lands and buildings mortgaged, \$95,000).....	47,400.00
Interest due and accrued on said bond and mortgage loans, bond and other assets.....	4,179.00
Bills receivable and call loans secured by collateral.....	3,316.65
Premiums in course of collection.....	120,118.17
Cash in company's office and in National, State and City Bank, Richmond, Va.....	99,067.76
	\$1,641,607.77

### LIABILITIES

Capital stock.....	\$250,000.00
Reserve for losses unpaid, including losses in course of adjustment.....	58,392.42
Reserved for unearned premiums.....	683,850.17
State, municipal and county taxes due and accrued.....	12,500.00
Dividend declared in December, 1912, due January 2, 1913..	12,500.00
Reserve for accounts incurred in December, 1912.....	500.00
Reserve for December, 1912, reinsurance accounts, due January 15, 1913.....	3,317.66
Surplus, beyond capital and all liabilities.....	620,547.52
	\$1,641,607.77

WM. H. PALMER  
President

W. H. MCCARTHY  
Secretary

## To Build Up the South

is the laudable ambition of every man in the South

## How to Build Up the South

should be the special study of every man in the South

**A**MONG the great drains upon the cash resources of the South probably none has been greater than the Insurance drain. Insurance is a recognized necessity, and as such must be had by Southern people. Until recently the money spent by Southern people has gone to increase the financial strength and enlarge the influence of institutions of other States. Within the past few years, however, the South began to study the subject of insurance—LIFE INSURANCE in particular—with the result that several old-line, legal reserve, level premium life insurance companies have been organized for the purpose of stopping this drain upon southern resources, which had run up into HUNDREDS OF MILLIONS OF DOLLARS. These southern companies furnish insurance at rates as reasonable as those of the older companies, and value their policies by the same rigid standards. Their funds are ALL invested in the South, and aside from this fact their lower expense and higher interest should give BETTER NET RESULTS to policyholders than can be given by the older and larger companies.

THE

## North State Life Insurance Co.

KINSTON, N. C.

is one of these vigorous young companies that is helping to build up the South. It operates only in the Carolinas.

N. J. ROUSE, President  
A. E. ROUNTREE, Secretary  
S. R. DUNN, Cashier

J. A. HERNDON, General Manager  
DR. J. M. PARROTT, Medical Director  
MILES M. DAWSON, Consulting Actuary

## CASUALTY DEPARTMENT

**GEORGIA LIFE INSURANCE COMPANY**

MACON, GEORGIA

W. E. SMALL, - - - - President

---

Surplus and Reserves as to Policyholders over \$800,000  
\$225,000 deposited with Georgia Insurance Department

---

**A STRONG SOUTHERN COMPANY**

Writing the following lines of

**CASUALTY INSURANCE**

Personal Accident  
Health  
Plate Glass

Burglary  
Liability  
Steam Boiler

Workmen's Collective  
Automobile  
Fidelity and Surety Bonds

COMPLETE INSPECTION SERVICE

UNEXCELLED CLAIM SERVICE

UP-TO-DATE POLICY CONTRACTS

"The Casualty Department \*\*\*\*\* has been doing business less than three years, in which time it has experienced a very healthy growth. It is now doing business in ten States, has a productive agency plant, is well regulated and well equipped for operating a general Casualty business, and its experience and conditions indicate energetic, economical and conservative management."—(Extract from Report of Examination made by Kentucky Insurance Department, December, 1912.)

The EASIEST Way to

**Make a Dollar Go the Farthest**

Is to send it away for Life Insurance

The BEST WAY is to

**Keep It at Home <sup>and make it do</sup> Double Duty**

—MORAL—

INSURE IN THE

**Southeastern Life Insurance Co.**

GREENVILLE, S. C.





## Trust Company Service in Baltimore

Accounts of Trust Companies  
Banks and Bankers Solicited

A Thoroughly Modern Banking Department with Ample Capital and Large Resources.

Acting in All Fiduciary Capacities for Corporations and Individuals.

Capital - - - \$1,350,000  
Surplus and Profits 2,400,000

The Continental Trust Company

BALTIMORE

S. DAVIES WARFIELD, President

## The First National Bank

OF RICHMOND, VA.

Capital, - - - \$ 2,000,000  
Surplus, - - - 1,000,000  
Deposits, - - - 14,000,000  
Resources, - - 20,000,000

WM. M. HABLSTON, Chairman of the Board

JNO. B. PURCELL,  
President

JNO. M. MILLER, Jr.,  
Vice-President

W. M. ADDISON, Cashier

ESTABLISHED 1865

## MARYLAND TRUST COMPANY BALTIMORE, MD.

### Statement of Condition at Close of Business December 31, 1912

ASSETS.		LIABILITIES AND CAPITAL.	
Cash on Deposit and in Hand.....	\$206,873.88	Deposits:	
Due from Banks and Bankers.....	93,029.26	Individual .....	\$1,054,923.02
Loans on Collateral:		Banks .....	110,141.64
Demand .....	\$1,215,255.89	Savings .....	21,151.58
Time .....	71,181.26	Trust Accounts.....	454,857.93
	1,286,437.15		\$1,641,074.17
Other Current Assets.....	41,472.21	Certified Checks.....	125.18
Investments:			\$1,641,199.35
Sundry Bonds, Stocks, Syndicate Participations, etc.....	\$1,135,019.05	Total Liabilities.....	
City of Baltimore 3½ per cent. Stock....	296,484.00	Excess of Assets over Liabilities represented by:	
Maryland Trust Building Co., entire		Undivided Profits....	\$445,116.20
Bonds and Stock..	525,000.00	Preferred Capital Stock .....	500,000.00
	1,956,503.05	Common Capital Stock	1,400,000.00
Office Furniture and Fixtures.....	2,000.00		1,945,116.20
Total Assets.....	\$3,586,315.55	NOTE:	
		Undivided Profits before Dividend.....	\$475,116.20
		Less Dividends on Preferred Stock paid during year..	30,000.00
		Balance of Undivided Profits, as above....	\$445,116.20
		Total Liabilities and Capital..	\$3,586,315.55

Accounts Solicited.  
Interest allowed on Deposits Subject to Check.  
Special Rates on Certificates of Deposit.  
Safe Deposit Boxes for Rent.  
Acts as Trustee under Railroad and other Mortgages, and as Agent for the Transfer and Registration of Stocks and Bonds.  
A Legal Depository for Court and Trust Funds.  
Transacts a General Trust and Banking Business.

#### OFFICERS.

L. S. ZIMMERMAN, President.  
OSCAR G. MURRAY, 1st Vice-President.  
CARROLL VAN NESS, 2d Vice-President.  
JERVIS SPENCER, JR., Sec. and Treas.  
IVAN SKINNER, { Assistant Secretary,  
                          { Assistant Treasurer.

#### DIRECTORS.

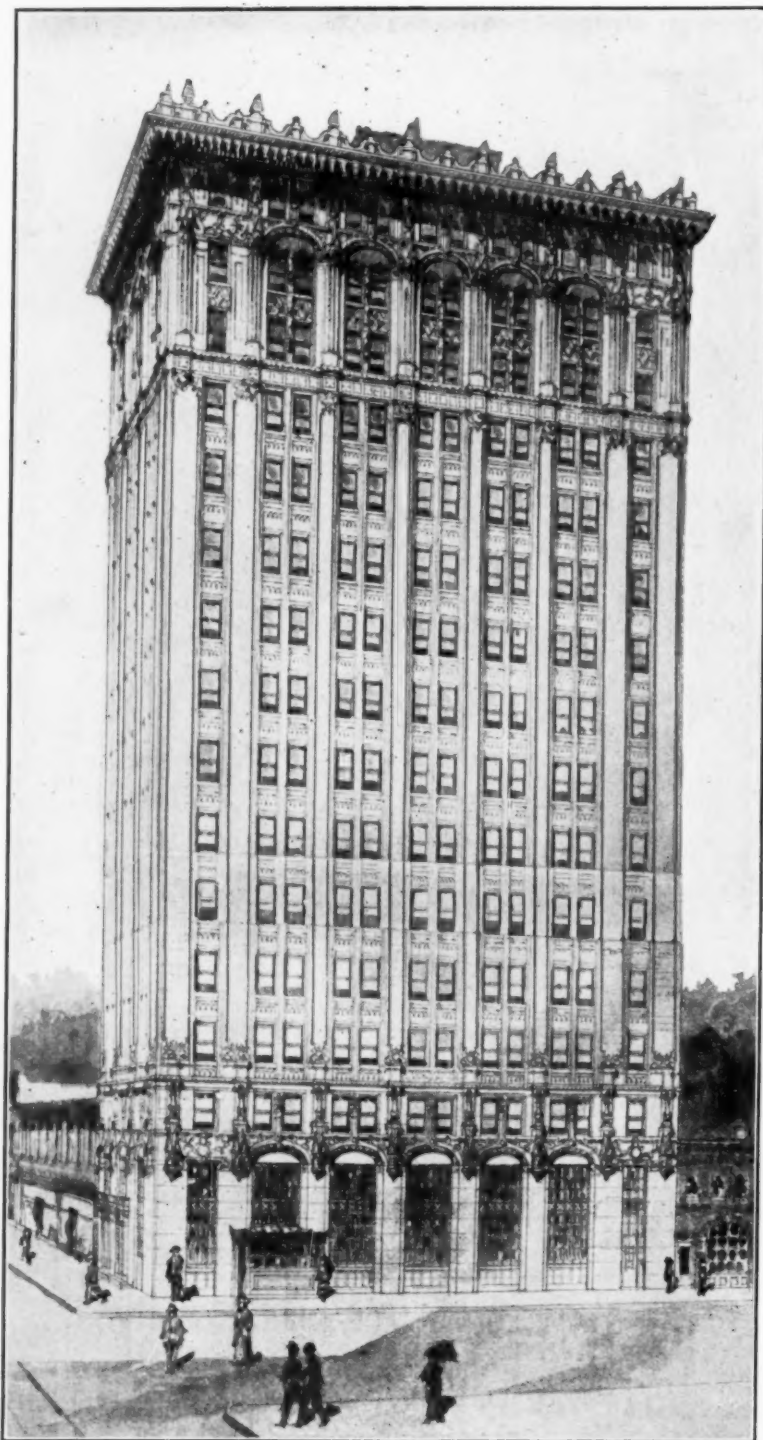
George W. Fleming, J. Barry Mahool,  
Baltimore, Baltimore,  
Joseph I. France, Henry C. Matthews,  
Baltimore, Baltimore,  
\*Robert Garrett, C. Wilbur Miller,  
Baltimore, Baltimore,  
Rufus M. Gibbs, \*Oscar G. Murray,  
Baltimore, Baltimore,  
\*B. Howell Griswold, Jr., James L. Sellman,  
Baltimore, Baltimore,  
George Garr Henry, \*John T. Stone,  
New York, Baltimore,  
A. Barton Hepburn, Theodore E. Straus,  
New York, Baltimore,  
John T. Hill, Arthur G. Wellington,  
Baltimore, Baltimore,  
\*George C. Jenkins, \*Henry B. Wilcox,  
Baltimore, Baltimore,  
\*J. V. McNeal, Douglas M. Wylie,  
Baltimore, Baltimore,  
L. S. Zimmerman, Baltimore,  
\*Members Executive Committee.

We have examined the books and accounts of the Maryland Trust Company, and WE HEREBY CERTIFY that the above statement correctly sets forth the Company's condition at the close of business on December 31, 1912.  
New York, January 18, 1913.

(Signed) HASKINS & SELLS, Certified Public Accountants.



# The Palmetto National Bank



THE 1913 HOME  
of  
THE PALMETTO NATIONAL BANK

of

## COLUMBIA, S. C.

THE CENTRAL CITY OF  
THE CENTRAL SOUTH  
ATLANTIC STATE

Capital

\$250,000.00

Surplus and Profits

\$150,000.00

Deposits

\$2,700,000.00

### OFFICERS

WILIE JONES, President  
JOHN JACOB SEIBELS, Vice-President  
THOMAS TAYLOR, 2nd Vice-President  
J. P. MATTHEWS, Cashier  
WM. M. GIBBES, JR., Asst. Cashier  
WESTON & AYCOCK, Solicitors

UNITED STATES DEPOSITORY

STATE, CITY AND COUNTY DEPOSITORY

WRITE US FOR TERMS FOR HANDLING YOUR

## South Carolina Business

We Have DIRECT DAILY Connection with Every Banking Point in the State

## Travelers Bank & Trust Company

Atlanta, Georgia

A strong and progressive banking institution in the Heart and Center of the New South.

Georgia is doing more to deserve outside capital than any other State in the Union. We preserve the principal of your investments, we conserve their integrity, and we give you greater proportionate returns thereon.

Georgia is the King Pin of the South's Progress, and the Big Ben of Her Awakening.

Georgia stands in the front rank with her wise and conservative legislation, guaranteeing protection to all legitimately invested capital.

This Bank can help you get in closer touch with Georgia and the South.

OFFICERS	
JOHN F. CONE President	GROVER MEGAHEE Cashier
W. S. LOUNSBURY Vice-President	W. H. PICKETT, JR. Assistant Cashier
ALLEN M. SCHOEN Vice-President	HENRY W. TODD Assistant Cashier

### TRAVELERS BANK & TRUST COMPANY

Peachtree and Walton Sts. Branch—297 Marietta St.  
Atlanta, Georgia

ARTHUR W. SMITH, President  
TOM O. SMITH, Vice-President  
W. H. MANLY, Cashier

BENSON CAIN, Asst. Cashier  
C. D. COTTEN, Asst. Cashier  
E. W. FINCH, Asst. Cashier

## Birmingham Trust and Savings Company

Capital, . . . . \$500,000.00  
Surplus, . . . . 550,000.00

BIRMINGHAM, ALABAMA

### DIRECTORS

ARTHUR W. SMITH, President.	F. H. LATHROP, Pres. Lathrop-Hatton Lumber Co.
TOM O. SMITH, Vice-President.	R. S. MUNGER, Director Continental Gin Co.
T. H. BENNERS, of T. H. Benners & Co.	W. T. NORTINGTON, Prattville, Alabama.
LEE C. BRADLEY, Attorney at Law.	H. J. PORTER, Pres. of Porter Clothing Co.
J. M. CALDWELL, Sec.-Treas. Caldwell Real Estate and Improvement Co.	JAMES SPENCE Tuscaloosa, Ala.
S. L. EARLE, of Earle Bros., Merchants.	R. A. TERRELL, Pres. Bank of Alabama, Ensley, Ala.
WILLIAM I. GRUBB, U. S. District Judge.	WILLIAM WOODWARD, Pres. Hanover National Bank, New York.
W. E. HENLEY, Sec.-Treas. Little-Cahaba Coal Co.	

## VIRGINIA TRUST COMPANY

RICHMOND, VA.

CAPITAL ONE MILLION DOLLARS

The Oldest Trust Company in the Old Dominion

### OFFICERS

HERBERT W. JACKSON, President  
JAMES N. BOYD, 1st Vice-President  
JNO. M. MILLER, Jr., 2nd Vice-President  
L. D. AYLETT, Secretary  
JNO. H. SOUTHALL, Treasurer

### BOARD OF DIRECTORS

E. B. ADDISON Director National State and City Bank	J. J. MONTAGUE Vice-President Planters National Bank Richmond
JAMES N. BOYD President Planters National Bank Richmond	SAMUEL T. MORGAN President Virginia-Carolina Chemical Company
JONATHAN BRYAN Real Estate	L. Z. MORRIS President Savings Bank of Richmond
J. ELWOOD COX President Commercial National Bank High Point, N. C.	JUNIUS B. MOSBY Capitalist
W. S. FORBES W. S. Forbes & Co., Wholesale Provisions	MORTON B. ROSENBAUM Director Planters National Bank Richmond
ASHLEY HORNE Merchant and Manufacturer Clayton, N. C.	FRITZ SITTERDING Vice-President Virginia Railway and Power Company
H. W. JACKSON President of the Company	T. C. WILLIAMS, Jr. Capitalist
JOHN M. MILLER, Jr. Vice-President First National Bank of Richmond	PHILIP WHITLOCK Capitalist
JOHN L. WINGO, Leaf Tobacco	

CAPITAL, SURPLUS AND PROFITS, \$791,000.00



SAVANNAH, GEORGIA

## GENERAL BANKING AND TRUST BUSINESS

Savings Department

BANKING AND TRUST PROPOSITIONS OF  
MERIT SOLICITED





Heard National Bank Building

For reservations, address

H. G. PERRINC, . . . Manager

ORGANIZED 1912

*The*  
**Heard National Bank**  
 JACKSONVILLE,  
 FLA.

Capital, . . . .	\$1,000,000.00
Surplus, . . . .	250,000.00

OFFICERS

J. J. HEARD, President	CLARENCE W. HENDLEY, Cashier
W. B. SADLER, Vice-President	JOHN M. BELL, Assistant Cashier
J. G. BOYD, Vice-President	GEO. C. MARLITT, Auditor

MAKE THIS BANK YOUR BANK

# Savannah Bank & Trust Company

SAVANNAH, GA.

CAPITAL AND SURPLUS

**\$1,200,000**

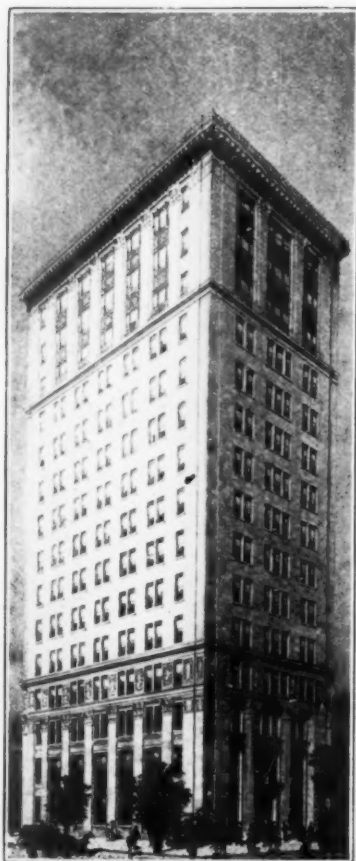
**A Southern Financial Stronghold**

General Banking, Savings—Trust

4% per Annum Paid On Savings Accounts—Computed Quarterly

WM. F. McCAULEY, President
CHAS. G. BELL, Vice-President
COURTNEY THORPE, Second Vice-President
M. D. PAPY, Cashier
E. M. NICHOLS, Asst. Cashier

**An Active Force in the South's Upbuilding**



# THE MERCHANTS NATIONAL BANK OF SAVANNAH

Established 1866

United States Depositary

## OFFICERS

JOSEPH HULL,  
President

A. B. HULL,  
Vice-President

W. M. DAVANT,  
Cashier

V. B. JENKINS,  
Assistant Cashier



## DIRECTORS

Joseph Hull  
A. B. Hull  
Malcolm Maclean  
J. F. Minis  
A. B. Moore  
J. L. Hammond  
Geo. J. Mills  
Jos. D. Taylor  
F. D. Tinsley  
R. S. Cope  
J. C. Little  
W. G. Strobhar

YOUR BUSINESS IS SOLICITED

Capital, Surplus and Undivided Profits . . . \$700,000.00

## Otto Marx & Co.

Investment Bankers

BIRMINGHAM, ALA.

Southern Investment Securities

STOCKS      BONDS      LOANS

Correspondence Invited

## Peoples Bank of Anderson

ANDERSON, S. C.

PAID-UP CAPITAL . . . \$200,000.00

We offer the complete service of a safe, solid and conservative bank

Special and personal attention given to collections

LEE G. HOLLEMAN, President  
JOS. J. FRETWELL, Vice-President  
D. O. BROWNE, Cashier  
T. S. BANISTER, Assistant Cashier

WE BUY

## BONDS

City, County, School, Drainage

We solicit correspondence from Public Officials, Contractors and others having bonds for sale. We specialize in Southern Securities and can handle all Contracts promptly.

## The New First National Bank

COLUMBUS, OHIO

Assets over \$6,000,000



## Lombard and Company

Third National Bank Building  
Atlanta, Georgia

Southern Investment Securities.

Selected Real Estate Mortgages on City and Farm Property.

Timber and Colonization Land

An Engineering Department prepared to Examine and Report on Industrial Developments.

CORRESPONDENCE SOLICITED

## Investing Millions In the South

"NEW WEALTH"—the legitimate creation of productive ability—finds its greatest development in many parts of the South. Recognizing this vital fact and its ever-growing importance, this House in recent years has handled millions of dollars of the best classes of

—SOUTHERN—  
Public Service Corporation Bonds  
Hydro-Electric Corporation Bonds  
Steam Railroad Bonds  
Municipal Tax - Protected Bonds

And other securities having proven, known value

We are constantly in the market, with a two-fold service:

TO THE INVESTOR, we offer the facilities of a peculiarly well-equipped organization, able to supply him with the very "cream" of investment offerings.

TO THOSE SEEKING CAPITAL, either to handle immediate needs to, or extensions of, existing properties, we offer ready co-operation.

How may we best serve YOU? Write us freely and frankly, that we may offer our facilities in either of the above divisions to YOU.

"A Record of Investments" will interest every holder of bonds.  
Sent on request.

D. ARTHUR BOWMAN & COMPANY  
Investment Bankers

Third National Bank Building SAINT LOUIS, MISSOURI

L. J. COOPER, Pres. S. H. EVERETT, Cashier JUDGE J. S. WILLIAMS, V.-Pres.

WAYCROSS SAVINGS AND TRUST CO.  
WAYCROSS, GA.

Capital and Profits, - - - \$175,000

6%

PAID ON SAVINGS DEPOSITS.

Coupon Certificates issued, interest payable quarterly in four detachable Coupons

ALL LOANS SECURED BY REAL ESTATE ON A 3 TO 1 BASIS

### Texas Farm Mortgages are Excelled by None

For adequate safety and security with substantial dividend yield. For—17—years we have been making farm loans in North Central Texas, and have never had a suit or foreclosure, and have now no past interest due, which is certainly evidence of our ability and success in safeguarding the interests of our clients.

#### THE MOST CONSERVATIVE

Life Insurance Companies in the Union invest in our North Central Texas Farm Mortgages. Write for booklet showing the REASON our farm mortgages are safer than bonds, yield larger dividends, and why you should buy them.

A. Y. CREAGER CO., Farm Loans  
SHERMAN, TEXAS

6%

When you purchase from us a mortgage on Improved Georgia City or Farm Property you take as little chance as is humanly possible. You receive from 6% to 7%, and you can be sure of receiving it regularly. Your principal is amply protected. Let us send you our list of Loans and some very reliable literature.

SESSIONS LOAN & TRUST CO.  
MARIETTA, GA.

### OPPORTUNITY FOR PRACTICAL FOUNDRYMAN

with \$10,000 to invest as working capital in a well located and equipped foundry and machine plant now in successful operation at Johnson City, 10,000 population. Only plant serving a large and prosperous territory.

Only practical man with first-class references desired.

S. C. WILLIAMS

JOHNSON CITY, TENN.

PAGE & TAYLOR  
REAL ESTATE BROKERS

Factory Sites with Deep Water and Belt Line Connections  
303-304 Arcade Building, - - - NORFOLK, VA.

## MONEY TO LOAN On Downtown Business Properties

IN CITIES HAVING A POPULATION OF 30,000 OR OVER

¶ We will finance that new building for you on our *serial payment* plan. By this plan the loan is repaid in annual installments.

¶ If you contemplate erecting a new building or refunding an existing loan on business property, get in touch with us. Correspondence and interviews invited. Address

REAL ESTATE LOAN DEPARTMENT

MERCANTILE TRUST COMPANY, - - - Saint Louis, Missouri  
Capital and Surplus - \$9,500,000

FESTUS J. WADE, President

J. B. MOBERLY, Real Estate Loan Officer

## COOKE, HOLTZ & CO.

### INVESTMENT SECURITIES

H. T. HOLTZ, President  
 ANDREW COOKE, Vice-President  
 CHAS. HOWELLS COFFIN, Secretary  
 JOSEPH W. GRAY, Treasurer

Incorporated  
 Cash Capital \$500,000

We purchase entire issues of Public Utility Corporation Bonds and Debentures, in amounts of \$500,000 and upwards, issued by well-established properties, serving prosperous and growing communities; also entire issues of Municipal Bonds of Counties, Cities, Towns, School Districts and Drainage Districts.

We invite correspondence with Bankers, Dealers, or Operators of Public Utility Corporation properties with reference to the financing or sale of such properties.

#### WE OWN AND OFFER

an attractive selection of Municipal and Public Utility Corporation Bonds yielding from 4½% to 6%, suitable for the investment of the funds of Estates, Banks, Institutions and Private Investors.

Descriptive Circulars Sent on Request

39 South LaSalle Street

CHICAGO, ILLINOIS

## ASSETS REALIZATION COMPANY

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Capital and Surplus, \$11,000,000

---

Finances established enterprises handicapped by inadequate capital. Buys short term bond issues on operating properties. Special facilities for investigation and supervision anywhere in United States.

—  
 [CORRESPONDENCE INVITED]  
 —

25 BROAD STREET  
 New York

LAFAYETTE BLDG.  
 Philadelphia

FIRST NATIONAL BANK BLDG.  
 Chicago

## WE BUY MUNICIPAL BONDS

City, Town, County, School  
 Road or Drainage District from Municipalities, Contractors or Attorneys

---

Our twenty years' experience insures prompt and efficient service

---

Cutter, May & Company  
 THE ROOKERY CHICAGO



# Americans and Europeans Come to Alabama

## U. S. A.

### We Are Wide Open to the Immigration of the World

From 38,000 people to 180,000 humans in 10 years—245.04 per cent.—this is the record of Greater Birmingham, the fastest growing young city in all America.

The growth of Birmingham has not been from blue-sky boosters; in fact, the people of this great city have been too busy to shout and sing out their praises over the land. They have been and are at work from sunrise to sunset, content and knowing that they are laboring on ground that is priceless; land that contains untold millions in minerals; land that will yield under the plow bumper crops of foodstuffs that will feed all their people for all time to come.

There is a reason for Birmingham. It is the only place in America where iron, coal and flux are mined side by side in the same fields; hence Birmingham dictates the price of iron for the world.

Its coal is nearer to deep water than any other coal field in America.

Greater Birmingham and the district is destined to have a million people. Buy the bonds of the American Finance & Bond Co.; large or small, cash or on the installment plan; they are guaranteed and indorsed by the banks and leading business men of Alabama; they are the fruit of well-earned real estate advances; bought at ground-floor prices and raised to office buildings and improved farms. Transactions too large for a small individual, but not too large for a lot of small individuals whose money is pooled together and invested in safe and steady increasing real estate. Investments made by men who know their business, the same as an able banker knows his business. You make your deposit and we guarantee it by issuing you a Gold Bond, paying you 6 per cent. and an interest in the earnings of the company. You are not bothered in mak-

American Finance & Bond Co.



Birmingham, Ala., U. S. A.  
American Trust Bldg., Seventh Floor  
Principal Northern Offices  
Philadelphia Nat'l Bank Bldg.  
Philadelphia, Pa.

We are indorsed by the banks, railroads and business men of Alabama. Write us. See us. If we haven't got what you want, we will get it at a less price than anybody.

European immigration via Mobile after the opening of the Panama Canal. American immigration via Mobile and every border city or town in the State, where welcome and the big key hangs over every door.

Our slogan is "Be an American and live and trade in Alabama."

## American Finance & Bond Company

BIRMINGHAM, ALA.

ing your money earn you the interest; we do not bother; you clip your coupons and cash them.

Central and other real estate in Alabama, property that has real tangible value, is our assets and our guarantee. We do not invest outside the State, but we receive orders for our bonds from everywhere.

We can invest millions for years to come because we know how to invest. Write us.

We live where we are first to welcome and last to say good-by to that great and growing tide of commerce and the immigration of both hemispheres.

We are on the real backbone of the real REAL ESTATE which has wealth untold or unconceived, so vast is its dimensions.

The language of every nation and country is spoken here. Contentment prevails, because there is work for everybody from everywhere at high wages. We are new, because we were recently discovered; hence we are making laws consistent for all Americans.

Join the army of Alabama landowners while good land is cheap. Lands we are selling at \$30 an acre planted yields \$200 an acre. We are the new Pittsburgh of the South and the new Birmingham of England.

Our port is Mobile, the Philadelphia of the South. Navigable rivers with good steamboats and recently-built railways with best passenger coaches supply Birmingham, the district and other inland cities of this great State of Alabama.

We have bought up some of the best old plantations of Old Alabama, and are cutting up some of them into little farms and new towns of New Alabama. Some lands we are selling in large tracts for developers of this country and Europe. Some of this land contains iron, coal, marble, timber, etc.; some all agricultural lands.



Principal Northern Offices  
Philadelphia Nat'l Bank Bldg.  
Philadelphia, Pa.

## High-Grade Investments

### WE OFFER, SUBJECT TO SALE:

- 75,000 North Carolina State 4s, due 1949-1950.
- 50,000 Southern Power Company 5s, due 1930.
- 30,000 First Mortgage Real Estate 6s, due 1922.
- 15,000 National Bank Stocks and Trust Company Stocks.
- 25,000 High-Grade 6 and 7 per cent. non-taxable preferred stocks.
- 250,000 Selected Southern Mill Stocks.
- 34,000 Improved Central Property, one block of Independence Square.
- 200,000 Improved Central Property.
- 19,000 Central Business Building Site.
- 30,000 Tryon Street Business Building Site.
- 12,500 Trade Street Business Building Site.
- 15,000 Trade Street Business Building Site.
- 45,000 Trade Street Business Building Site.
- 11,000 South College Street Business Building Site.
- 36,000 Tryon Street Business Building Site.
- 30,000 Suburban Acreage Tract within City Limits.
- 30,000 Suburban Acreage Tract adjoining Myers Park.
- 100,000 Improved Residence Properties in Charlotte.
- 250,000 Suburban Home Sites—Colonial, Piedmont, Wilmoore.

## F. C. ABBOTT & CO.

Everything in Real Estate      High-Grade Investments

Insurance in Strong Companies

1001-1002 Commercial National Bank Building

CHARLOTTE, N. C.

## John W. Dickey

Southern Investment Securities

Augusta - - Georgia

# The J. G. White Companies

## International Engineers Contractors, Financiers, Managers

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### J. G. WHITE & COMPANY, INC.

Purchase, Finance and Develop Water Power, Gas, Electric Light, Steam, Electric Railway and Power Properties.

Public Utility Securities offered to Bankers.

---

### J. G. WHITE ENGINEERING CORPORATION

Design and Construct Hydro-Electric Plants and Transmissions, Central Stations, Steam and Electric Railroads, Pipe Lines, Gas Plants, Bridges and Water Works, Sewerage, Drainage and Irrigation Systems.

Engineering Reports, Physical Valuations and Appraisals.

Act as Purchasing and Forwarding Agents for Individuals, Contractors and Corporations.

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### J. G. WHITE MANAGEMENT CORPORATION

Managers of Public Service and Industrial Corporations.

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43 EXCHANGE PLACE, NEW YORK

Chicago

Manila

San Francisco

---

J. G. WHITE & COMPANY, Ltd.

9 CLOAK LANE, CANNON ST., LONDON, E. C.

PARA, BRAZIL; BUENOS AYRES, ARGENTINE; SANTIAGO, CHILI.



ORGANIZED 1871

# Life Insurance Company of Virginia,

HOME OFFICE:  
RICHMOND, VA.

J. G. WALKER, Pres. E. D. HARRIS, 1st Vice-Pres. W. L. T. ROGERSON, 2nd Vice-Pres. A. S. HURT, Secretary

OLDEST—LARGEST—STRONGEST Southern Life Insurance Company

It issues in its Ordinary Department the most liberal forms of Policies from \$1,000 to \$50,000 on the

## Non-Participating Plan

It issues Industrial Policies from \$8 to \$1,000, with premiums payable WEEKLY, on persons from two to seventy years of age.



NEW HOME OFFICE BUILDING.  
Owned and occupied exclusively by the Company.

Its Policies are clear and definite in their provisions, and their values are absolutely guaranteed.

Its history has been characterized by its liberal forms of Policies; its prompt settlement of Death Losses without litigation; its equitable dealing with its Policyholders; its strength of organization, and everything which contributes to the security and economy of Life Insurance.

Assets December 31, 1912.....	\$8,470,628 54
Liabilities December 31, 1912.....	6,992,626 35
Capital and Surplus December 31, 1912.....	1,478,002 19
Insurance in Force December 31, 1912.....	85,963,852 00
Total Payments to Policyholders since organization.....	12,986,813 35

Is Paying its Policyholders OVER \$1,000,000 Annually. All Claims Paid IMMEDIATELY Upon Receipt of Satisfactory Proofs of Death.  
GOOD TERRITORY OPEN FOR LIVE AGENTS. Address

F. E. HALL, Superintendent Ordinary Agencies,

Home Office: Richmond, Va.

## 81st ANNUAL STATEMENT

OF

## Virginia Fire and Marine Insurance Company

RICHMOND, VA.

JANUARY 1st, 1913

### ASSETS

Stocks and bonds.....	\$1,296,567.75
Real estate owned by the company.....	70,958.44
Loans on bond and mortgage (first liens, value of lands and buildings mortgaged, \$95,000).....	47,400.00
Interest due and accrued on said bond and mortgage loans, bond and other assets.....	4,179.00
Bills receivable and call loans secured by collateral.....	3,316.65
Premiums in course of collection.....	120,118.17
Cash in company's office and in National, State and City Bank, Richmond, Va.....	99,067.76
	\$1,641,607.77

### LIABILITIES

Capital stock.....	\$250,000.00
Reserve for losses unpaid, including losses in course of adjustment.....	58,392.42
Reserved for unearned premiums.....	683,850.17
State, municipal and county taxes due and accrued.....	12,500.00
Dividend declared in December, 1912, due January 2, 1913.....	12,500.00
Reserve for accounts incurred in December, 1912.....	500.00
Reserve for December, 1912, reinsurance accounts, due January 15, 1913.....	3,317.66
Surplus, beyond capital and all liabilities.....	620,547.52
	\$1,641,607.77

WM. H. PALMER  
PresidentW. H. MCCARTHY  
Secretary

## To Build Up the South

is the laudable ambition of every man in the South

## How to Build Up the South

should be the special study of every man in the South

**A**MONG the great drains upon the cash resources of the South probably none has been greater than the Insurance drain. Insurance is a recognized necessity, and as such must be had by Southern people. Until recently the money spent by Southern people has gone to increase the financial strength and enlarge the influence of institutions of other States. Within the past few years, however, the South began to study the subject of insurance—LIFE INSURANCE in particular—with the result that several old-line, legal reserve, level premium life insurance companies have been organized for the purpose of stopping this drain upon southern resources, which had run up into HUNDREDS OF MILLIONS OF DOLLARS. These southern companies furnish insurance at rates as reasonable as those of the older companies, and value their policies by the same rigid standards. Their funds are ALL invested in the South, and aside from this fact their lower expense and higher interest should give BETTER NET RESULTS to policyholders than can be given by the older and larger companies.

## THE North State Life Insurance Co.

KINSTON, N. C.

is one of these vigorous young companies that is helping to build up the South. It operates only in the Carolinas.

N. J. ROUSE, President  
A. E. ROUNTREE, Secretary  
S. R. DUNN, CashierJ. A. HERNDON, General Manager  
DR. J. M. PARROTT, Medical Director  
MILES M. DAWSON, Consulting Actuary

## CASUALTY DEPARTMENT

**GEORGIA LIFE INSURANCE COMPANY**

MACON, GEORGIA

W. E. SMALL, - - - - President

---

Surplus and Reserves as to Policyholders over \$800,000  
\$225,000 deposited with Georgia Insurance Department

---

**A STRONG SOUTHERN COMPANY**

Writing the following lines of

**CASUALTY INSURANCE**

Personal Accident  
Health  
Plate Glass

Burglary  
Liability  
Steam Boiler

Workmen's Collective  
Automobile  
Fidelity and Surety Bonds

COMPLETE INSPECTION SERVICE

UNEXCELLED CLAIM SERVICE

UP-TO-DATE POLICY CONTRACTS

"The Casualty Department \*\*\*\*\* has been doing business less than three years, in which time it has experienced a very healthy growth. It is now doing business in ten States, has a productive agency plant, is well regulated and well equipped for operating a general Casualty business, and its experience and conditions indicate energetic, economical and conservative management."—(Extract from Report of Examination made by Kentucky Insurance Department, December, 1912.)

The EASIEST Way to

**Make a Dollar Go the Farthest**

Is to send it away for Life Insurance

The BEST WAY is to

**Keep It at Home <sup>and make it do</sup> Double Duty**

—MORAL—

INSURE IN THE

**Southeastern Life Insurance Co.**

GREENVILLE, S. C.



# WILMINGTON, NORTH CAROLINA

In the Heart of the South's Best Garden Climate  
Lumber Labor  
Trucking Shipping Center

## READ:

The two institutions named below will cheerfully and promptly answer inquiries from prospective business, manufacturing, professional, agricultural people who may be interested in coming to this favored and growing city and section

Will Furnish Liberal Accommodations for New Comers

### THE SOUTHERN NATIONAL BANK

Capital and Surplus, \$300,000.00

Commercial Accounts

CHAS. N. EVANS, President

J. A. TAYLOR, Vice-President

J. W. SIMPSON, Cashier

W. C. DENNY, Asst. Cashier

Assets, \$2,000,000.00

### THE ATLANTIC TRUST AND BANKING COMPANY

Capital and Surplus, \$165,000.00

Savings Accounts 4%

CHAS. N. EVANS, President

J. G. L. GIESCHEN, Vice-President

MILTON CALDER, Cashier

Assets, \$1,000,000.00



SEASONABLE CAPACITY PRODUCTION  
—the ability and efficient equipment to produce and market reliable, salable goods —  
IS THE MANUFACTURER'S GREATEST ASSET.

EFFICIENT ORGANIZATION backed by ample resources—the desire and ability to pay its losses — IS THE FIRE INSURANCE COMPANY'S GREATEST ASSET.

On the threshold of its Sixtieth Year of uninterrupted public service, with abundant resources, and set purpose to maintain the position of supremacy in the front rank of Efficient Fire Insurance Companies

The **HOME** Insurance Company  
NEW YORK

ELBRIDGE G. SNOW, President

Solicits a continuance of that generous patronage—which makes it possible for The HOME to provide the safest form of Fire Insurance Indemnity.

Losses paid since Organization  
over \$139,000,000



## WASHINGTON, N. C.

THE BEST TOWN IN

is located in the central part of the coast country and is especially rich in Agriculture, Manufacturing and Commercial achievements and possibilities.

### WE NEED—

#### A Paper Mill

Have 600 million feet of Gum especially suited for manufacturing KRAFT PAPER.

#### A Canning Factory

Sweet Potatoes can be raised at a profit of 35c. per bushel, and the soil is adapted for raising Cucumbers, Tomatoes, Corn, Beets, etc.

Washington is situated on the Pamlico River. Has three railroads, enjoying both rail and water competition in freight rates.

We invite personal inspection and correspondence. Address

### THE CHAMBER OF COMMERCE WASHINGTON, NORTH CAROLINA

Climate similar to that of Southern France and Italy

## KINSTON NORTH CAROLINA

The Central City of the East; the City of Opportunity. Situated in the Center of America's Garden Spot, it has

### Nature as an Ally

The AIR is pure and invigorating; the soil rich and varied. The RAINFALL is right for the best production of crops. The drinking water from overflow artesian wells is clear and pure.

### Kinston is Opportunity's Call to You

To PRODUCE easily and abundantly anything grown outside the tropics.

To MANUFACTURE the products of Mother Earth, with materials, labor and power easily accessible.

To MARKET the products of the farm or factory, by the aid of the navigable Neuse River and railways entering and leaving the city from five directions. Only eighteen hours from New York.

To LIVE in a city of commercial push and progress where wealth is distributed and co-operation the watchword; in a city where schools are first-class and churches abound; in a city where the glad hand of welcome awaits you.

For information address

### THE CHAMBER OF COMMERCE

C. FELIX HARVEY, President

FRED. I. SUTTON, Secretary  
KINSTON, N. C.

One Hundred and Eighty-five Bushels of Corn to the Acre, at a Cost of Nineteen Cents Per Bushel, Was the Record of One of Our Boys Last Spring

## Investigate Lincolnton North Carolina

The town with the PUREST PUBLIC WATER supply in the State.

A beautiful little City of 3000 population. Increase during last decade of 192 per cent.

Location unsurpassed for healthful climate, excellent schools, churches and social conditions.

Splendid AGRICULTURAL RESOURCES. NO BETTER LAND ANYWHERE. GOOD FARMS AT LOW PRICES.

Special inducements for manufacturers of all kinds, ESPECIALLY WOODWORKING PLANTS. Cheap Hydro Electric Power. Transportation facilities first class. Seaboard Air Line and C. & N. W. Railways.

For information in detail address

### Lincolnton Development Club

M. H. GROVES, Secretary

P. O. Box No. 237

## "THE LATCH STRING HANGS ON THE OUTSIDE"

All that goes with the old-time Southern hospitality will be freely and genuinely extended to newcomers to Oxford, N. C., by the Granville Commercial Club. Manufacturers seeking industrial location; Investors seeking profitable investments; Home-seekers looking for a location with climatic and educational advantages; Farmers looking for a delightful climate and favorable business conditions; in short, all men of all occupations who wish to exchange the more rigorous climate of the North and West, and at the same time join in and reap the advantage of the great industrial development that is gaining headway in the South, will meet with a hearty welcome. Personal efforts to assist in a comfortable and profitable "setting" in the life of our community will be unstintingly given.

There are lots of good towns in the South, but Oxford is one of the best.

For information, address

BENJ. K. LASSITER

Chairman New Industries Committee

A. H. POWELL  
President

D. G. BRUMMITT  
Secretary

### GRANVILLE COMMERCIAL CLUB

OXFORD, NORTH CAROLINA

## Tarboro, N. C.

— IS THE COUNTY SEAT OF —  
EDGECOMBE COUNTY

One of the largest cotton, peanut, tobacco-growing and trucking counties in the South.

Soil adapted to the growing of peaches, grapes, pecans and all small grains.

Water and rail transportation gives quick access to Northern markets.

We have some facts that will interest you. Write

### Board of Trade

TARBORO, N. C.

No Better Climate

No Better People



# RALEIGH

NORTH CAROLINA

# HAS THE GOODS

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LET US PROVE IT TO YOU

A Chamber  
of Commerce  
with a thousand  
members stands  
back of  
Raleigh's  
claims

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Write the Chamber of Commerce  
for information regarding anything



## We believe the South is in fact the Nation's Greatest Asset

We believe each year of Southern development will make this fact more apparent.

With the utmost admiration for the achievements of the American people in every State, we still believe the South to be the nation's greatest asset, and urge you to come and help us develop the resources of this really wonderful Sunny Southland, that they may become useful to mankind.

The South is not merely a place to make money—its wealth-producing resources, consisting of Agriculture, Minerals, Forest Products, Water-Powers and Manufactures, are second to none and superior to many—it is a place to live a well-rounded life while making money.

The South has always maintained high ideals; it takes its politics and religion seriously, honors culture and capacity in preference to mere dollars, and is altogether a delightful country in which to live and carry on your life work, be that what it may.

## Greensboro, North Carolina

is a true Southern city, which is worthy of your careful consideration in selecting a place for your future activities.

Greensboro is located near the center of the far-famed Piedmont region about 150 miles from the Atlantic Seaboard and 50 miles from the Blue Ridge Mountains, 288 miles south of Washington on main line of the Southern Railway.

The climate of Greensboro, Guilford, and adjoining counties is probably as nearly ideal as the Creator intended any climate to be, with an altitude of 843 feet, seasons are well defined, yet free from the rigors of Northern winters or the enervating heat of lower altitudes farther South. The City of Greensboro is amply supplied with as pure water as can be boasted of by any city anywhere, while the country abounds in springs. In man-made assets Greensboro is fully abreast of the times, its merchants and professional men are prepared to supply every necessity and many luxuries on a moment's notice.

Greensboro is under Commission form of government, its public improvements and utilities are fully up, and in some particulars superior, to the average city of its size.

The population of Greensboro in 1910 was 15,895, a ten-year increase of 58 per cent.; just outside the city limits are nearly, if not quite, an equal number of people. Not only has Greensboro made no effort to swell its official population by annexing purely agricultural territory, but has failed to secure credit for her legitimate population; to that extent she is behind the times. The religious facilities of Greensboro consist of ample churches, many magnificent, others less pretentious, supplemented by a splendid Y. M. C. A. building.

The educational facilities consist of standard city schools, added to which is a well-stocked Library, and a really remarkable grouping of colleges and schools of higher education both in the city and but a few miles outside. Industrially Greensboro has proven her right to challenge your attention, she has more than forty jobbing and manufacturing concerns, six home insurance companies, two life and four fire, all prosperous.

The product of her shops is distributed to every State in the Union and some foreign lands, and there is room and a hearty welcome for more.

## Guilford County

offers magnificent opportunities to the agriculturist of every character. If you have plenty of money and want a less trying climate, come to Guilford and locate on one of its 150 miles of such roads as you see here; if you have less money, you can secure independence here more quickly than in many other places. Guilford County is not an experiment, it has a history of more than one hundred years. Every fruit and grain, except tropical, is successfully grown here. Live Stock, Poultry or any other branch of country life you are familiar with can be carried on with greater profit, more comfort and amid more pleasant surroundings than in most other countries, where lands are being extensively advertised, and sold at several times their cost to the advertiser, while the purchaser pays a fancy price for an agricultural experiment and the hardships of the pioneer.

*Let us tell you more about Greensboro and Guilford County, North Carolina.*

## Chamber of Commerce

GREENSBORO, N. C.





**WATCH  
CHARLOTTE  
GROW**

**GETTING  
TOGETHER**

Charlotte is laid out on BIG, Broad and Generous Plans—As a City it has no equal in the South—The men of its make-up are much as the city—Big, Broad and Generous.

## TALK ABOUT GROWING

The 1910 Census gave Charlotte's population as 34,014. Now those who have charge of compiling the directory fix the number of Charlotte residents at 47,100. The Charlotte Power Company has data showing that during the past year 1000 families have come to Charlotte as householders, and the Greater Charlotte Club has data showing that during the twelve months just ended 6,270 people have come to Charlotte, and on their files there is a list of thousands of interested inquirers who want to come to Charlotte to live and GROW.

## Queen Charlotte of Mecklenburg

NORTH CAROLINA

Offers Peculiar Advantages Along Many and Varied Lines

**INDUSTRIAL:**

Cheap Power—Ample Labor—Raw Material—Abundant Market—Excellent Transportation Facilities—\$5,000,000 Annual Pay Roll.

**RESIDENTIAL:**

Piedmont Climate—No Heat Prostrations—No Deaths from Cold—No Droughts—No Floods—Low Living Expenses.

**EDUCATIONAL:**

Three Colleges—Thirteen Ward Schools—One Hundred and Nineteen Instructors—Excellent equipment and Adequate Buildings.

**RURAL ENVIRONMENT:**

Prosperity's backbone is Agriculture. Especially is this true of the South, where 85% of the people are rural residents. In 1911 the total value of Farm Products for North Carolina was \$123,069,000. All crops, Cotton and Corn, plenty of Wheat and Oats and Tobacco, Truck farming and all diversified Agriculture flourishes about Charlotte, and there are more miles of macadamized roads leading into this city than any other in the State; in fact, the approaches to the city have been the subject of much comment throughout the United States.

**FOR THE ASKING:**

You will receive every item of information, not only about Charlotte, but about her environs, and WHY YOU should come with us in the building of the Greatest Industrial metropolis of the new era of central Southern supremacy.

## The Greater Charlotte Club

CHARLOTTE, N. C.

CHARLES C. HOOK  
President

LEAKE CARRAWAY  
Managing Secy.

"The Electric Centre"

**THE GREATER  
CHARLOTTE CLUB**

Its business is "Personally Conducted." All inquiries are handled confidentially by men of unquestioned integrity.

**WATCH  
CHARLOTTE  
GROW**

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S A L I S B U R Y . S

Salisbury's the Place

## For Successful Manufacturers and Wholesalers

**M**ANUFACTURERS AND WHOLESALERS will find Salisbury advantageously located for supplying not only the States of North Carolina, South Carolina and Virginia, but the entire Southeast. Railroad lines in four directions. The largest freight transfer station in the South located here gives us great advantage as a shipping point. Through freights and package cars made up for all principal points in the country. Salisbury's freight reaches its destination from 24 to 72 hours earlier than that shipped from other points in this section, which means much to manufacturers and wholesalers.

Many desirable factory sites on railroads, in and near city at reasonable prices. A few good ones will be donated. Electric power from Southern Power Co. Expert mechanical labor, and mill help, both male and female, plentiful. Living conditions good. Most economical city in this section in which to live and do business. Excellent water, ideal climate, good school system, good health prevails, social environment ideal, etc. Play ground system under expert manager. Population 20,000 within six square miles.

Some of the manufacturing plants and wholesale houses that would meet with great success here are given below. Kindly write us for booklet and full information, and ask us why you would succeed in Salisbury. After a careful study and investigation we are sure the following would meet with success:

Knitting Mills,  
Overall Factories,  
Metal Working Plants,  
Furniture Factories,  
Handle Factories,  
Wheelbarrow Works,  
Cotton Goods Plants,  
Canning Factories,

Buggy and Wagon Factories,  
Work Shirt Factories,  
Farm Implement Factories,  
Wood Working Plants,  
Wholesale Hardware Houses,  
Wholesale Drug Houses,  
Wholesale Machinery Houses,  
Wholesale Meat Houses, Etc.

Harness Factories,  
Chair Factories,  
Bagging Factories,  
Paper Mills,  
Creamery,  
Foundries,  
Brick Plants,  
Silk Mills, Etc.

## Rowan County's the County For Successful Farmers

**W**HILE the "South is the Nation's Greatest Asset," the agricultural resources are the "South's Greatest Asset." Rowan county is located in the very heart of the Piedmont section—the South's richest farming section. You can buy lands from \$15 to \$100 per acre in this county now. Price according to distance from the city and condition of land. This county is destined to become the greatest truck, grain, berry and fruit county in the whole section. Cotton, alfalfa, pecans, etc., will grow here with great results.

Farmers in this county have good schools, roads, churches, water, ideal climate, good market, good

health conditions, beautiful country, etc. The soils are mostly of three kinds: red clay, sandy loam and sand-clay mixed. The Rowan farmers are progressive and a good set of people to live among. A farm expert is paid a good salary to assist the farmers of the county and advance their interest in every way possible. Stock and poultry raising is becoming very popular in Rowan. Now is the time for you to buy Rowan lands, as a little later they will be hard to buy at any price.

Write us now for any information regarding the farming possibilities and conditions, etc., or about anything else regarding Salisbury and Rowan county.

## Salisbury Industrial Club

JAS. H. WARBURTON, Secretary

SALISBURY

NORTH CAROLINA



# SPARTANBURG, S. C.

Elevation, 816 feet; Community Population, 30,000; Average Rainfall, 47 inches; Average Temperature, 61.

County has 38 Cotton Mills, Employing 10,000 People, with \$15,300,000 Invested; 785,000 Spindles; 21,000 Looms; Product Valued at \$12,500,000. Industrial Investment, \$17,500,000; Wages, Not Including Salaries, \$2,100,000.

Educational Center of South Carolina. Greatest Music Festival in the South.

Over \$1,500,000 Being Spent in Improving Spartanburg in 1913



WITHIN FIFTY MILES

Over 500,000 Population. Over 70,000 Electric Horse-Power. Over 80,000 Electric Horse-Power available for development. Over \$7,000,000 Invested. Over 3,500,000 Spindles. Over 77,000 Looms. Over \$55,000,000 in Textiles. Over one-fourth of all the Spindles in the South. Over sixty cents in Textiles for every man, woman and child in the United States. Over five dollars in Hydro-Electric Water Powers for every man, woman and child in South Carolina. Over \$2,000,000 in Fertilizers manufactured annually. Every degree of climate; every variety of soil; every industrial opportunity; fruits, vegetables, grains, potatoes, poultry, cattle, etc. Low cost of living, Railroads to everywhere.

Investigation will prove the opportunities of Spartanburg and vicinity to be more wonderful than any to be found elsewhere. Correspondence invited, but personal visits preferred. Address:

**CHAMBER OF COMMERCE, SPARTANBURG, S. C.**

## CHESTER South Carolina

Offers the greatest opportunities of any town in the South to the home-seeker, investor, promoter or manufacturer.

**MANUFACTURING.**—Chester now has yarn mills, cloth mills, overall factory, ice plant, fertilizer plant, machine shops, etc. The railroad facilities, electric power and an abundance of raw material are some of the many inducements to the manufacturer.

**HYDRO-ELECTRIC POWER.**—On Broad River, fifteen miles to the west, are two power plants, furnishing power to run nearby cotton mills. On the east side are three developments, two of which are owned by the Southern Power Company, located only twenty-five miles from Chester, which generate sixty thousand horse-power. The cheapness, abundance and convenience of electric power are special inducements to the small manufacturer.

**RAILROAD FACILITIES.**—Chester is situated on the main lines of the S. A. L. Railway, Southern Railway, C. & N. W. Railway and L. & C. Railway. Through express trains several times each day place Chester only eighteen hours from New York and in close touch with all the Eastern seaport towns as well as the larger inland cities. A trolley line from Chester to Great Falls, a distance of twenty-five miles, is contemplated. This would be a splendid opportunity for any promoter, for the line would run through the richest agricultural section of the county.

**AGRICULTURE.**—The soil and climate of the county are well adapted to all forms of agriculture. Corn, cotton, grain, hay crops and various kinds of truck are successfully grown here.

**FRUIT GROWING.**—Commercial orchards are successfully run here for the nearby markets. Fruits of all kinds are grown successfully.

**STOCK RAISING.**—No county in the State takes more premiums at the Annual State Fair on cattle than Chester County. The finest herd of Hereford cattle in the South Atlantic States is kept here. Mules and horses better than any brought from the West are raised by our stock men.

Chester has all the conveniences of any modern city, such as water, sewerage, lights, paved sidewalks and streets.

### THE HALF HAS NOT YET BEEN TOLD

For further information write

**COMMERCIAL CLUB**

**CHESTER, SOUTH CAROLINA**

## GEORGETOWN

SOUTH CAROLINA

### A Growing Seaport

Having good rail and ocean transportation facilities, cordially invites

Investors Homeseekers

Farmers Manufacturers

and others contemplating making a change, to visit Georgetown, and see opportunities existing in City and County.

**RICH FARM LANDS OFFERED  
AT REASONABLE PRICES**

Come and grow with us; you will be welcome. Write for information and literature to

### CHAMBER OF COMMERCE

GEORGETOWN

SOUTH CAROLINA

## Marion, South Carolina "City of Opportunities"

Population 5000 and Growing

Great opportunities for investment in manufacturing enterprises and farming. In heart of greatest farming country in the world. Good water, good schools and good roads. Ice Plant and Gas Plant wanted now.

### WE WANT YOU

### Marion Chamber of Commerce

R. J. BLACKWELL, President

O. K. LaROQUE, Secy. and Treas.

## MULLINS, S. C.

LOCATED ON

A. C. L. and S. A. L. Railroads

### We Have

3 Strong Banks.  
3000 Good People.  
Excellent Schools.  
Four Churches.  
Two Tobacco Factories.  
Six Tobacco Warehouses.  
Two Large Lumber Mills.  
Electric Lights.  
\$100,000.00 worth Good Roads.  
Best Land in the South, that can be easily obtained in small farms at very reasonable terms and prices.

### We Want

Buggy Factory.  
Wagon Factory.  
Furniture Factory.  
10,000 Energetic People.  
Fruit and Vegetable Cannery.  
Trucking Possibilities: No finer lands anywhere.  
15,000 bales of cotton raised within radius seven miles; 10,000,000 pounds tobacco.  
18 hours from Philadelphia. Climate can't be beat. No malaria, people healthy.

For information, write at once

Address W. M. McINTYRE, Secretary

CHAMBER OF COMMERCE



## Hopkinsville, Ky.

12,000  
1912

35,000  
1920

### The Pearl City of the Pennyroyal

THE ONLY INLAND CITY IN KENTUCKY  
WITH A FUTURE

Hopkinsville is located in Christian County, the second largest county in the State, having an area of 694 square miles, or 440,060 acres. Christian County produces a larger and better variety of products than any other county in the State.

Christian County has over 250 miles of macadamized roads, which enable her citizens to bring their product to market the whole year.

Hopkinsville, having the best location in Western Kentucky, is an ideal place for manufacturers.

### WHY?

**BECAUSE—** Hopkinsville has unexcelled railroad facilities. Three railroads, with bright prospects for the fourth, and two interurban railroads.

**BECAUSE—** Hopkinsville can furnish electric power, light, gas and water as cheap as any city in Western Kentucky.

**BECAUSE—** Hopkinsville will furnish factory sites and buildings as cheap as any city and will aid in financing any reliable institution.

**BECAUSE** Hopkinsville offers to the laborers the best of educational facilities, having two colleges, one One-Hundred-Thousand-Dollar High School and four excellent graded schools. Churches of all denominations. Three parks, with all amusements.

**BECAUSE—** Hopkinsville is over 85 miles from any city of any consequence; therefore, Hopkinsville will be in a short time the distributing point for all Western Kentucky and Tennessee.

Hopkinsville is the second largest Tobacco market in the world (Dark Tobacco).

Hopkinsville has four banks, with deposits of \$2,676,000.

If you are interested in making a change, want a better location for the business you are in, want a city for locating a branch of your business, or should you want to live in a clean, healthy and the most progressive city in the Union, then write to our Trade Extension Department, care of H. B. M. A., Hopkinsville, Ky.

### Hopkinsville Business Men's Association

INCORPORATED

HOPKINSVILLE, KENTUCKY

### "The Undisputed Queen"

OF THE

Tennessee River Valley

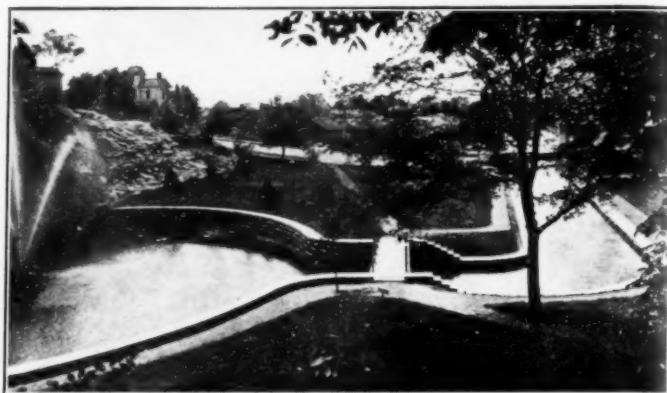
## HUNTSVILLE, ALABAMA

Is the CITY OF OPPORTUNITY + PLUS +

Equitable Climate: there are others

Enchanting Scenery: there may be others

Two Trunk Line Railroads: plenty of others



—BUT—

The most magnificent spring of purest crystal water, with an unceasing daily flow of 24,000,000 gallons without trace of acid or iron. Unsurpassed for use of pulp and paper mills, with raw material in abundance. Some of the largest manufacturing plants of the South located here. Free sites—free water—cheap hydro-electric power—tax exemption. Magnificent homes—old colonial and modern side by side. Monte Sano—"Mountain of Health"—1000 feet above city—offers ideal summer residence.

Madison County Lands of Unsurpassed Fertility,  
Prize-Winning Stock Farms

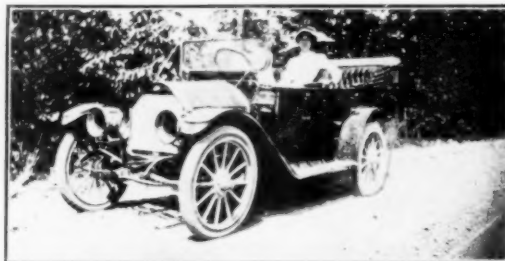
WRITE

CHAMBER OF COMMERCE

## COFFEEVILLE

MISSISSIPPI

Has concrete sidewalks all over town; 150 miles well-graded roads surrounding it; pure water from 20 artesian wells; four R. F. D. routes; rural telephones in every direction; health record among highest in State. Cannot enumerate all resources here.



ROAD NEAR COFFEEVILLE

Coffeeville and Vicinity Needs and  
will Welcome

### MEN AND CAPITAL

to develop Electric and Gas Light and Power Plants, Drainage Canals, Truck-growing (two crops Irish potatoes a year), Stock Raising, Dairying, Lumber and Woodworking Mills, Brick and Tile Plants, and many others.

Many fine farms cheap now, but going higher.

Fine Graded Schools, Churches, Lodges, Telephones, Rural Routes and good Society make this an ideal place for a home as well as for business.

Come to Coffeeville. For more information address

P. M. WOODALL, Secy. Board of Trade

# YAZOO CITY

## MISSISSIPPI

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### Queen City of the Far-Famed Mississippi Delta

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Located on the Yazoo & Mississippi Valley Railroad, and on the Yazoo River, navigable at all seasons. Yazoo River is the dividing line between the great Yazoo-Mississippi Valley and the plateau country. County site of Yazoo County, which is half in the Delta and half in the hills. Second largest County in the State, containing 476,000 acres.

The place to manufacture is where the raw material is found. No location for wood-working plants superior to this, the center of the finest body of hardwood timber in the world. Two new railroad lines in immediate prospect. Growth of Yazoo City in past decade 72 per cent. Located in what is conceded to be the most fertile agricultural land in the world. Manufacturing opportunities unexcelled and their development just begun. Large deposits of brick and fire clay material immediately surrounding the city.

A City of every modern equipment; electric lights and electric street railway; water works and the finest fire equipment in the State. Streets thoroughly paved, both sidewalks and roadways. School and church facilities unsurpassed. Four thriving banks with aggregate deposits of about \$2,000,000. Generally conceded to be one of the most progressive cities in Mississippi.

Finest staple cotton in the world grown in Yazoo County. Fine Delta lands at great bargains. Governor Brewer of Mississippi, an expert authority, estimates increase of value of these lands at 20 per cent. per annum for the next five years. Timber lands can be bought at from \$15.00 to \$25.00 per acre, and land will be worth from \$30.00 to \$50.00 per acre at present prices after timber is taken off and used. No finer pasturage for live stock can be found. Fruits and vegetables very prolific.

Changes in methods of farming make it possible to buy these fine lands at a most profitable investment price.

For full information write to

**YAZOO COMMERCIAL CLUB**  
**YAZOO CITY, MISS.**





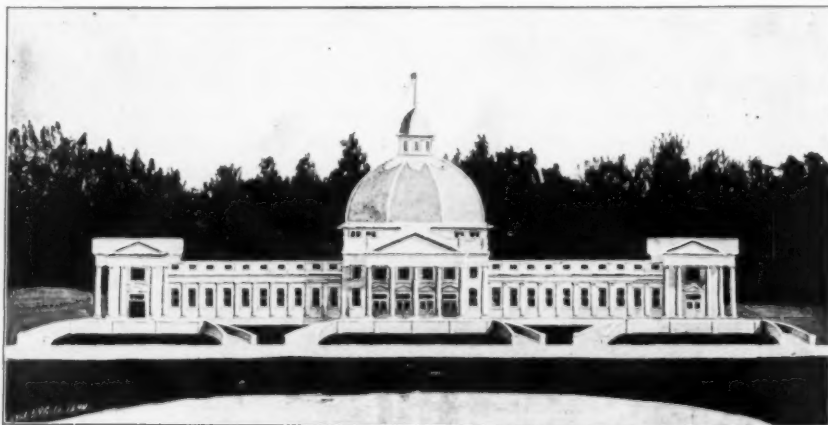
UPPER LAKE AND LIBERAL ARTS BUILDING, NATIONAL CONSERVATION EXPOSITION.

## THE SOUTH ON DISPLAY

The Resources, the industrial progress, the ways by which the bounties of nature may be made perpetual sources of wealth for the Southern States and the Nation, will be shown at

### The National Conservation Exposition KNOXVILLE, TENN.

September 1st to November 1st, 1913



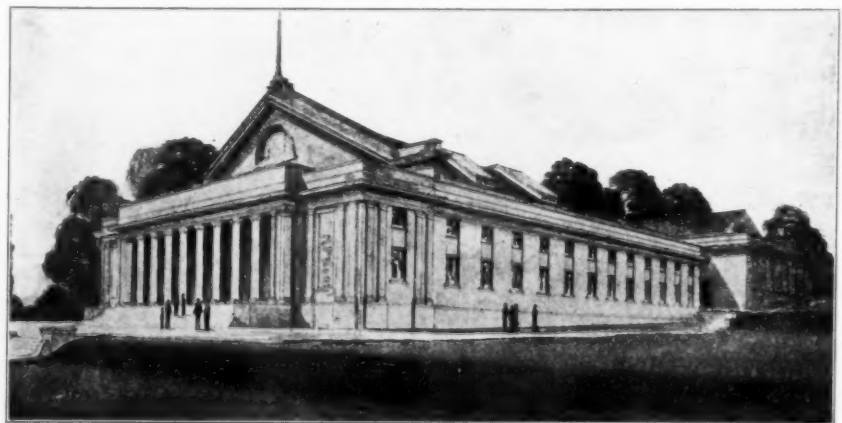
SOUTHERN STATES BUILDING, NATIONAL CONSERVATION EXPOSITION.

The exposition, while national in scope, will make the South its special field. The Southern States Building, designed to contain exhibits of Southern manufactured products, will be one of the prominent features. In the Land Building will be exhibited minerals, timber, the soils of the South and their products, together with such displays from experiment stations and departments of agriculture in the sixteen Southern States as will promote the highest development and best use of these resources.

## The Opportunity for Manufacturers

The Southern States Building and the Machinery and Liberal Arts Building will afford several acres of floor space for exhibits of machinery and manufactures. The conservation features will be brought to the front not only in displays relating to forests, farms, waters, health, etc., but in exhibits of machinery and implements that will save time and waste of material. This is the opportunity for makers of machinery and other lines to get in touch with Southern buyers. The leading cities of the South are to be represented; exposition boards, organized in the States of the Southeast, are working up interest in State exhibits. The progress of the South in all lines of manufacturing will be shown; the opportunities for greater progress will be graphically presented.

Exposition site embraces 100 acres. Nine buildings completed. Six to be erected. Other large buildings proposed, besides a number of smaller structures.



LAND BUILDING, NATIONAL CONSERVATION EXPOSITION.

WRITE FOR ILLUSTRATED BOOKLET, FLOOR PLANS, Etc.

# OPPORTUNITY IN TENNESSEE

## FOR THE Homeseeker, the Investor, the Manufacturer

### FOR THE HOMESEAKER

Tennessee has never so much to offer the seeker for a home as now. The pioneers who braved the hardships of the wilderness and fought their way across the mountains to establish the first settlement at Watauga found in this great State nothing to compare to the present opportunity for well-doing and well-being. The work of the people of the nineteenth century is the heritage of the people of the twentieth. They laid the foundation on which a magnificent superstructure is now being erected. Those who really and earnestly desire to make good by the investment of a reasonable amount of work and cash can find no better opportunity than Tennessee offers.

Tennessee is a land of agricultural opportunity. Land is cheap—cheaper than in any of the States of the West and Middle West or Northwest. Land can be bought in the eastern and middle sections for colonization purposes, in 5000 or 10,000-acre tracts, at from \$5 to \$15 per acre. This land is excellently adapted to general farming, live-stock raising, horticulture and market gardening. The value of farm products in 1912 was \$125,000,000. The value of farm property is \$500,000,000.

Transportation facilities are good, both by water and rail. Five great trunk lines of railway traverse the State, and many branch roads extend from the main lines. Products of the farm can be easily and cheaply sent to such markets as Nashville, Memphis, Chattanooga, Knoxville, Louisville, Cincinnati, St. Louis, Chicago. Early vegetables and fruits from Tennessee reach Northern markets in time to command the best prices.

**LIVE STOCK.**—The agriculture of Tennessee is characterized by its high-class farm live-stock. Conditions are favorable for the cheap production of all classes of domestic animals. Bluegrass is indigenous, and the grazing season extends from eight

to nine months of the year. The value of live-stock in Tennessee in 1910 was \$110,000,000.

**DAIRYING.**—While dairying is already one of the most important industries of the State and yields a substantial revenue, it may be said that the industry is still in its infancy. The increasing demands of the larger markets convenient to this State will continue to make this industry one of the most profitable to be pursued. For low rates of sustenance of dairy stock, computed upon the head basis; in productivity of soil, and in ideal climatic conditions, which permit of the cheap housing of animals during the winter season and provide green food the year around, Tennessee may be justly termed "Dairyland."

The conditions of soil and climate favor the production of abundant crops of grains, hay and the root vegetables in varieties which provide a supply of green feeds throughout the year.

**FRUIT.**—From the time of earliest settlement Tennessee has been noted for fine fruit, and this is rapidly becoming one of the State's most important industries. As fine apples can be grown on land in Tennessee, purchasable now at \$10 an acre, as can be grown on lands in the States of the far Northwest selling for \$1500 to \$2000 an acre.

**CLIMATE AND RAINFALL.**—In climate Tennessee is exempt from the extremes of heat and cold, varying from a freezing temperature in January to about 80 degrees in the summer months. The average temperature of the year is about 60 degrees.

The average annual rainfall is about 53 inches, and is so distributed during the growing season that crop failures are unknown. The period between killing frosts varies from 162 to 228 days, giving ample time for tender vegetation to mature.

### FOR THE MANUFACTURER

The manufacturing industries of Tennessee are gaining in importance each year. The value of manufactured products in 1909 was \$180,217,000. The capital invested is \$167,924,000, as compared with \$63,141,000 in 1899, an increase of nearly \$105,000,000 in ten years. The number of manufacturing establishments in the State is 4609, and the number of persons engaged in manufacturing, including proprietors, salaried employees and wage-earners, is 87,672. The State's greatest industry is lumber and timber, with 1977 establishments, giving employment to 22,389 wage-earners, and products valued at \$30,-

457,000. Flour and grist mill products rank second, with a value at \$29,070,000. With excellent shipping facilities; with a climate adapted to all sorts of manufacturing; with great water-power being rapidly developed; with almost inexhaustible coal fields and beds of the best iron ore, zinc, copper, etc.; with vast forests of hardwood timber as yet hardly touched by the axe and saw, and with the whole world for a market, Tennessee offers a splendid field for any manufacturer with ordinary sense and spirit.

### FACTS WORTH KNOWING ABOUT TENNESSEE

Population, 1910, 2,184,789.  
The population of Tennessee averages 52 to the square mile.  
The taxable property of the State is about \$500,000,000.  
Value of all farm property, 1910, including domestic animals, \$612,520,836.  
Value of domestic animals, poultry and bees, 1910, \$110,706,078.  
Value of farm products, 1912, \$125,000,000.  
Value of manufactured products in 1910, \$137,900,000.  
Value of timber products in 1905, \$26,000,000.  
Value of mineral products in 1910, \$20,000,000.  
Tennessee touches eight other States, and possesses the combined attractions of all the eight.  
Marble is found in all the grand divisions of the State.  
Tennessee's rank among the States in population is seventeenth.  
Bluegrass grows spontaneously on Tennessee limestone lands.  
Two crops of potatoes can be grown on the same land the same year, and the production per acre is from 100 to 300 bushels.  
A crop of wheat and a crop of corn may be harvested from the same land the same year.  
Crop productions of Northern and Southern States meet and overlap in Tennessee.

### INDUCEMENTS TO IMMIGRANTS

It is the best country for the man of moderate means.  
There is a certainty of profitable returns from whatever is put into the soil.  
There are more and better opportunities for diversified farming than elsewhere.  
The seasons are regular, the rainfall ample and well distributed, and there is no fear of crop failure.  
Truck farming is a success. Products, being early on the market, obtain high prices.

It is worthy of note that every crop scheduled in the Federal census is grown to some extent in Tennessee.

The elevated plateaus of the State are excellently adapted to fruit culture.

Corn is Tennessee's greatest crop, and exceeds in value all others. Truck farmers have cleared as high as \$500 per acre on lands in West Tennessee.

There is a difference in elevation, from the high mountains of East Tennessee to the alluvial plains of the Mississippi, of over 6000 feet.

Tennessee offers unlimited supplies of raw material of all kinds to the manufacturer.

In the production of phosphate rock Tennessee ranks second, standing next to Florida.

Extensive areas of valuable clay deposits are found in Tennessee.

A Tennessee steer won first prize at the International Stock Show held in Chicago several years ago.

A fleece from a Tennessee sheep won first prize in a world competition at London.

Fruits of every kind common to the temperate zone thrive in Tennessee.

There are more chances for profitable investment of capital than elsewhere in the country.

Happiness, comfort and health await homeseekers in Tennessee, whose citizens gladly welcome newcomers to a region of schools, churches, social advantages and good neighbors.

Good farming lands can be purchased at low prices—lands capable of high cultivation, and producing, under right treatment and by diversification, two, three and sometimes four crops a year.

Inquiries will be cheerfully answered and Literature furnished by the

## Tennessee Bureau of Immigration,

T. F. Peck, Commissioner

NASHVILLE, TENN.



# COME TO BRISTOL, VA.—TENN.



UNION PASSENGER STATION



CITY HALL ON VIRGINIA SIDE



TENN. VA.

## AN INDUSTRIAL CENTER

### Bristol Manufactures

Trunks; Books and Loose Leaf Binders; Brooms; Washboards; Mantles; Sash and Doors; Toys; Coffins and Caskets; Mattresses; Glass Sand; Cement Brick and Blocks; Household Cleansing Preparations; Metal Polish; Stoves and Ranges; Engines and Boilers; Car and Mine Wheels; Steel Dump Mine Cars; Foundry Products; Sheet Metal, Ceilings, Shingles, etc.; Cornices and Gutters; Flour, Meal and Feed Stuffs; Canned Goods; Packing-House Products; Ice; Wood Columns; all kinds of Building Material; Overalls and Pants; Neckties and Hosiery; Merchants' Account Registers; Lace Cabinets; Porch and Lawn Swings; Screen Doors and Windows; Distilled Spirits; Drugs and Chemicals; Pharmaceutical Preparations; Proprietary Remedies; Lumber; Leather; Paper; Extracts; Candy; Well and Irrigation Pumps; Butter and Ice Cream; Parquet Flooring.

**BRISTOL IS THE LARGEST JOBBING CENTER, POPULATION CONSIDERED, IN THE UNITED STATES, AND HAS DOUBLED ITS JOBBING BUSINESS IN THE LAST THREE YEARS.**

### Central Location

Bristol's past and future development has been and will be aided by its favorable geographical location, being the point in the central mountain area where railways meet. It is the logical distributing point now and always will be for a tremendous consuming territory. The laws of commercial gravity alone have selected Bristol as the assembly ground for the vast mineral deposits of the surrounding mountains. Think what it means to a manufacturer in a city which can reach the Gulf Coast, the Atlantic Seaboard, and the Eastern cities and the Mississippi River at practically the same freight rates.

### Banking Facilities

The policy of the Bristol Banks is to give every encouragement to business enterprises. Investors will find ample banking facilities and men in charge who will give them the most active co-operation. They are as follows:

First National Bank	Aggregate
Dominion National Bank	Bank
Bank of Bristol	Deposits about
Washington Trust and Savings Bank	\$2,000,000.

### Bristol Offers Manufacturers

Who are seeking a location for a plant to manufacture wood or iron products, textiles employing large numbers of female help, every possible advantage in the way of raw material, speed and economy of transportation, friendly attitude of labor and cheap power. We are much interested right now in the location of one or more furniture plants, a brick plant and smaller concerns to manufacture negligee shirts, canvas gloves and the more popular form of knit goods.

### Cheap Electric Power

The power-house of the Watauga Power Co., located at Elizabethton, Tenn., with a development of 4500 H. P., and which was **BUILT FOR BRISTOL**, enables us to meet the power price of any city in the United States outside of Niagara Falls.

The investor may seek far and wide and find no more varied opportunities for his capital and brain than are offered within the boundaries of the nearby fields and hillsides.

## Board of Trade

Bristol, Va.—Tenn.



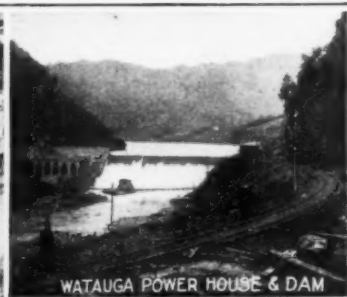
BRISTOL DOOR &amp; LUMBER CO.



PETER-McCAIN LUMBER CO.



DIXIE TANNERY



WATAUGA POWER HOUSE &amp; DAM



COLUMBIAN PAPER MILLS

Sites for New Industries—FREE.

Power for New Industries First Year—FREE.

Raw Material for Industries—FIRST MILL COST.

Rate on Best Steam Coal 75 Cents.

Ample White Labor \$1.25 to \$2.00 per day.

Commodity Rates on Finished Products.

## Johnson City, Tenn.

### Home of Oak and Poplar

Johnson City is the recognized mill center for Appalachian Hardwoods, saving to manufacturers in first cost of raw material from \$2 to \$8 per M feet of oak, poplar, chestnut, birch and maple lumber.

### Non-Metallic Minerals Abound

Johnson City is in the heart of the wonderful deposits of non-metallic minerals that are making the territory penetrated by present and projected lines of railways a prospective leader five years hence in the output of clays, limestone, kaolin, feldspar, iron ore and various other materials of value to commercial interests.

### Getting the Finished Product To Market

Johnson City has a direct line of freight communication to South Carolina and South Atlantic coast points—an air line to the fast developing cotton, lumber, mineral and manufacturing sections of the Mexican gulf states—through freight service to Philadelphia and New York, and is the home of The Clinchfield Railway, which serves a vast empire of timber and coal operations in Southwest Virginia and Eastern Kentucky.

### Hydro-Electric Power

Johnson City has that which concerns the manufacturer most, outside of available raw material at first cost—Cheap Power. Two large power plants have just been built and are prepared to offer special rates to all manufacturing plants that will locate in Johnson City.

### The Mecca For All Tourists

Johnson City is the Mecca for tourists who seek the most direct route to the extreme high altitudes of the Blue Ridge. Altapass, the gorges of the Nolachucky and the Doe, Grandfather Peak, Sugarloaf and other noted points are best reached out of Johnson City.

### Through Passenger Traffic

Johnson City is directly on line of through fast trains operating between New York and New Orleans, New York and Memphis, and will soon be the shortest cut from Cleveland and Cincinnati to Charleston and Savannah.

### Homes, Schools, Churches

Johnson City is a home and educational center, having wide streets and avenues, many of them paved with brick and asphalt—handsome churches representing practically all denominations. Here is located Tennessee's great training school for teachers, and the Federal Government has spent more than \$5,000,000 on the National Soldiers' Home just outside the city limits, forming a most beautiful park that is always open to the public.

### Climate and Health

Johnson City enjoys an altitude of 1700 feet, and is therefore free from the heat, malaria and mosquitoes that are a pest in many otherwise delightful cities of the South and East.

Purest freestone water supply for population of 50,000 people. Write for literature.

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## THE COMMERCIAL CLUB

JOHNSON CITY

TENNESSEE



# DECATUR—NEW DECATUR, ALA.

## In the Heart of the Tennessee Valley

On the south bank of the Tennessee River and at the Junction of the Southern and The Louisville & Nashville Railroads. Midway between the cold of the extreme North and the heat of the extreme South. Population 1910 over 10,000. Population today over 12,000. One of the fastest growing cities in the State of Alabama today. Fine schools and churches, magnificent sewer system, one of the best paved cities in the South, electric street railway, gas, electric lights, great white way and all mod-

Decatur—New Decatur presents rare opportunities for manufacturing of every kind, on account of proximity of raw material and very reasonable freight rates by river and by rail.

Exceptionable opportunities are afforded here for wholesale and retail business in all lines. In addition to our railroad and river facilities this county has a fine system of turnpikes leading in all directions out of Decatur—New Decatur.

To the home seeker, who for any reason seeking a new location to



\$25,000 CITY HALL, DECATUR, ALA., RECENTLY BUILT.



BANK STREET, DECATUR, ALA.



SECOND AVENUE, NEW DECATUR, ALA.

ern improvements, a magnificent water works and filtering plant.

Surrounded by the richest and most productive lands in the South. Producing corn and all small grain, fruits and vegetables and cotton, the great money crop of the South.



GULF COTTON COMPRESS, 20,000 BALES OF COTTON, NEW DECATUR, ALA.

build a home free from inclement, damp, cold, disagreeable winters will find here in North Alabama an ideal location for health, happiness and prosperity. We invite you to come to a land possessing all the advantages of your present home in the way of churches and cordial friendly hospitality.

For further information address

**J. W. CUNNINGHAM,**  
Sect'y Chamber of Commerce, Decatur, Ala.,

OR

**F. F. TIDWELL,**  
President Development Co., New Decatur, Ala.

## ORANGE, TEXAS

### Nature's Outlet to the Sea

OFFERS SOMETHING WORTH WHILE TO  
MANUFACTURERS AND HOMESEEEKERS

**I**S an important city. Population seventy-five hundred. Growing. Valuable transportation facilities. Location wonderfully strategic. Deep water to the Gulf. Good people. Handsome homes. Splendid streets. Good schools and churches. Pure water. Perfect health conditions. Fertile lands. Good all-year-round climate.

While the crowd is rushing to the flash of ten-page advertisers, you stop at Orange, and pick up far better opportunities.

A WELCOME  
AWAITS YOU HERE

Write

THE ORANGE COMMERCIAL CLUB

E. W. ANDERSON, Secretary

## Grand Saline, Texas

### SALT CITY OF SOUTHWEST

Population 2500.

Located on Main Line of Texas & Pacific Railroad, which runs 12 passenger trains daily. Also on Main Line of Texas Short Line Railway.

Three large salt plants, employing between 300 and 500 men.

Largest lignite mines in the South are located near Grand Saline, with an output in excess of 1000 tons per day.

Oil and gas indications the very best.

Investigate our industrial opportunities.

Agricultural resources of this section are limitless. We are in center of one of the richest Fruit and Truck Growing sections of the Southwest, and there are some splendid openings for parties interested along this line, and land can be had at very reasonable prices. Seventeen thousand bales of cotton were marketed in Grand Saline this past season. Crop failures unknown.

One of the smallest cemeteries in Texas.

If you move here, you will never leave.

The home of the famous Grand Saline Concert Band, which numbers 40 members. This organization is destined to become the most famous musical organization in the South.

Sixty-six miles east of Dallas; 250 north of Houston; an ideal factory town. We need a cotton-oil mill, cotton factory, ice factory, canning factory, fruit-jar factory and box factory.

For full particulars address

Chamber of Commerce

GRAND SALINE, TEXAS

## Where Should a Manufacturer Locate?

There are five leading questions on which he must decide: raw material, labor, transportation, market and site.

No city should attempt to locate a factory unless it has proof that average good management will produce profits.

No manufacturer should decide on location unless the total advantages in analyzing the situation prove that average good management will produce profits.

SAN ANTONIO is analyzing its own situation; taking stock of its opportunities.

SAN ANTONIO does not wish a plant unless an analysis shows that there is the promise of success.

We know the list of those plants which we believe would stand only an indifferent chance of success—and we don't want them.

But, we also have a list of those which we believe will succeed, and we are ready to argue the case.

Are you seeking a better location for your plant or jobbing house? Are you seeking location for a branch?

SAN ANTONIO wishes to talk business with you.

Chamber of Commerce,

Industrial Division

San Antonio, Texas

(LARGEST CITY IN TEXAS)



# Cities Are Known By THEIR PRODUCTS

Did you ever stop to consider this—think over the names of a few cities, and you will invariably link with their respective names some well-known product.

FORT WORTH is known the world over as the SECOND LIVE STOCK MARKET AND PACKING HOUSE CENTER in the country, which means that millions of dollars change hands here annually and is distributed through the banks, railroads and business enterprises.

FORT WORTH has thirteen trunk lines of railroads radiating in 17 directions, with the best facilities for assembling raw materials and distributing freight of any city in the Southwest.

FORT WORTH is the leading grain market of the entire Southwest, having 18 elevators with combined storage capacity of approximately 4,000,000 bushels.

FORT WORTH is the wholesale grocery distributing point of the Southwest, has 282 Jobbing and Manufacturing Houses, a larger pay roll, a larger average wage, more laboring men and less trouble with labor than any city in Texas.

RIGHT NOW IS THE TIME FOR MORE FACTORIES TO LOCATE HERE. PROSPECTS WERE NEVER BETTER IN TEXAS.

We have natural gas for manufacturing purposes at extremely low rates.

We have electric power at water power rates. (One of the largest plants in the South is located here.)

This is the home of the Gulf Oil Refinery, and the Pierce Fordyce Oil Refinery—many of our factories using oil for fuel.

This being a central railroad point, freight rates on coal are nominal.

## FORT WORTH NEEDS

A Cotton Mill	A Shoe Manufacturer
A Clothing Manufacturer	A Wholesale Shirt Factory
A Leather Tannery	A Bed Factory
A Hosiery and Underwear Manufacturer	A Buggy Factory

## THIS TRADE TERRITORY WILL SUPPORT

A Wholesale Dry Goods House	A Wholesale Millinery House
A Wholesale Hat House	A Wholesale Men's Furnishings House
A Wholesale Shoe House	A Wholesale Queensware and China House

In fact, FORT WORTH, the center of the most thickly populated part of Texas, will support any manufacturing or distributing enterprise that has commodities for people who are willing to pay top prices.

If the people of the North and East only knew of the wonderful opportunities awaiting them here, Fort Worth would have another 174% INCREASE IN POPULATION during the years of 1910 and 1920, as she had during the years 1900 and 1910.

For facts and figures and any special information address

**FORT WORTH CHAMBER OF COMMERCE**

**FORT WORTH, TEXAS**

G. H. CLIFFORD, President

R. O. McCORMACK, Secretary



# Southern Progress

As measured by the increasing demand for public utilities:

The management of electric railway, electric lighting and water power properties by the Stone & Webster Management Association was first undertaken in the South in 1900 at Tampa. Public utilities are now operated in Columbus, Savannah, Key West, Pensacola, Jacksonville, Baton Rouge, Dallas, Houston, Galveston, Fort Worth, El Paso, Beaumont and Port Arthur.

The population of the fourteen cities served was 340,000 in 1900, and by 1910 had increased to 587,500. This growth has created a demand for new capital which, in 1912 alone, amounted to over \$6,600,000.

The demand from these cities for power, light and transportation which, in the earliest years under the management of our organization, was measured by \$3,100,000 of gross earnings annually, was in 1912 in excess of \$9,800,000.

## STONE & WEBSTER

Established 1889

147 Milk Street

NEW YORK  
5 Nassau Street

BOSTON

CHICAGO  
604 First National Bank Building





DENISON, TEXAS—The Hub of the Southwest—Look at the Map



GOOD ROADS—DENISON DISTRICT ON THE CANADA-TO-THE-GULF HIGHWAY  
JULIAN C. FEILD, Consulting Engineer.

# DENISON

Invites Manufacturers and Wholesalers to investigate its advantages as to location, unsurpassed railroad facilities and other attractive features.

## DENISON NOW HAS

Largest Coffee Roasting Plant in the Southwest.

Second largest creosoting plant in the world.

The largest creosoting plant in Texas.

Largest Cotton Mill in Texas.

Two million dollar bonding and insurance company.

Three million dollar per annum railroad pay roll.

Bank capital, surplus and deposits of over \$3,000,000.

M., K. & T. shops, divisions and terminals, among the largest in the South.

Six railroads and interurbans.

Unlimited supply of pure water.

All public utilities and enterprises known to a progressive up-to-date municipality.

Richest agricultural section all about for diversified farming, fruit, truck and poultry raising, dairying, etc.

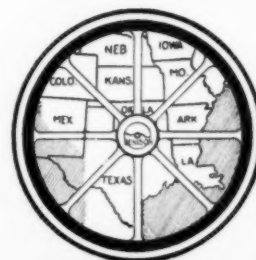
FOR FURTHER INFORMATION, ADDRESS CHAMBER OF COMMERCE  
DENISON, TEXAS



SOME INTERESTING DENISON VIEWS

DENISON IS THE LARGEST RAILROAD CENTER OF THE TEXAS-OKLAHOMA BORDER, WITH A PAY ROLL OF OVER 3 MILLION DOLLARS

Denison in the Heart of the Land of Golden Opportunities



Three Times  
WINNER  
of the  
FIRST PRIZE  
at the  
INTERNATIONAL  
FAIR  
San Antonio  
BEST  
Agricultural Display

# GONZALES

## TEXAS

### BANNER COUNTY

FINEST LAND  
in a  
Rapidly Developing  
Section  
at  
Reasonable Prices  
No Land Boom on  
but  
Homeseekers  
Wanted

#### THE BANNER COUNTY OF TEXAS

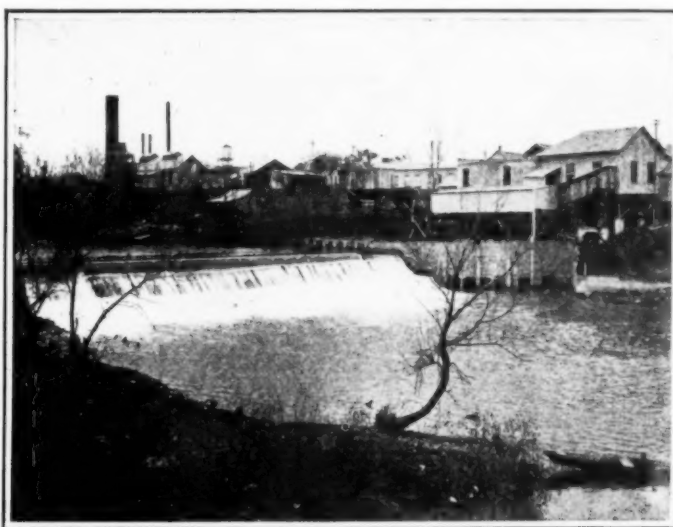
Three times winner of the first prize for the best agricultural exhibit at the International Fair, San Antonio (1907, 1908 and 1909), is the proud record of Gonzales county, and one unequaled by any other in Texas. The competition was open to the State of Texas, and when the varied resources of the State are considered, the victories of Gonzales county are one of which she may justly feel proud.

#### HEALTH, SCHOOLS AND CHURCHES

The general healthfulness of the section is as good as can be found in sections of like altitude, and much better than many. In addition to the four independent school districts in the larger towns, there are forty-three common school districts, where one hundred and thirty public schools are operating in the rural precincts. Churches of several denominations are also scattered over the county, and the citizenship, taken as a whole, are contented, law-abiding, industrious and progressive, and extend a hearty welcome to the homeseeker.

#### CLIMATE AND RAINFALL

The climate is mild, the mean minimum winter temperature being 44 and the mean maximum summer temperature being 93 degrees. The altitude above the sea level is about 300 feet, and cool Gulf breezes prevail during the heated terms. The rainfall averages 32 inches per annum, and in most instances is sufficient for most any crop. The San Marcos and Guadalupe rivers are bold perennial streams uniting near the city of Gonzales. Flowing water has been secured in many sections of the county at depths ranging from 300 to 600 feet, one farm in the county boasting 25 flowing wells.



DAM AND WATER-POWER PLANT AT GONZALES, TEX., DEVELOPING 1200 HORSE-POWER.  
Number of sites suitable for similar development are to be found in Gonzales county on both the San Marcos and Guadalupe rivers.



A GUADALUPE VALLEY FARM NEAR THE CITY OF GONZALES.

#### NO CROP FAILURES

For more than fifty years there has not been a crop failure in Gonzales county. There are no richer lands anywhere than those of the famed Guadalupe and San Marcos valleys, and the uplands are rapidly taking rank with the best. The principal crops are cotton, corn, grain and hay, and there are abundant opportunities here for farmers and truckers of the progressive class. In 1912 nearly 50,000 bales of cotton were raised in Gonzales county.

#### RESOURCES OF THE COUNTRY

In addition to farming and stock-raising, many other opportunities for investors present themselves here. An abundant supply of gas is found near the center of the county, and drilling for oil will soon begin there. Fine beds of kaolin are located five miles from the county-seat, and good building stone is also abundant. Water highly impregnated with medicinal properties is also found near the city, and minerals of several kinds have been discovered in many portions of the county. The never-failing streams offer fine opportunities for irrigation plants.

#### LAND VALUES

As this section has never been "Boomed," there are no fictitious land values here. The river valley lands range in price from \$50 to \$100 per acre. Post Oak sandy land ranges from \$15 to \$40, while mesquite uplands range from \$25 to \$75. Owing to the good crops raised here, these lands have enhanced in value at least 50 per cent. during the past three years, and further advances are looked for, although present prices are not as high as other lands in Texas which are no better crop producers.

#### THE CITY OF GONZALES

The population of the city, including the suburbs, is about 6000, and is the most important city between San Antonio and Houston. Two railroads, the G., H. & S. A. and the S. A. & A. P., give connections with outside points, with six passenger trains daily.

Four hotels, water-works, electric lights, water-power plant, cotton mill, brick factory, steam laundry, oil mill, machine shops, splendid churches, good schools and handsome residences are some of the things which show a progressive citizenship.

The water-power plant develops 1200 horse-power, and is one of the most important commercial features of the city.

A \$40,000 High School building is to be built during the summer, and \$175,000 is now being spent on the main public roads leading into the city. The city has three banks, with deposits of about \$1,500,000. The city is well supplied with public parks and plazas, and recently was awarded first prize in a State-wide contest for the cleanest town in Texas in its class.

FOR FURTHER INFORMATION ADDRESS

## BUSINESS MEN'S CLUB - - Gonzales, Tex.



## The Mineral Resources of Louisiana

offer a substantial basis for the development  
of large and profitable diversified  
chemical industries

These resources consist of sulphur, salt, petroleum, natural gas. There are also valuable deposits of clays and marbles.

The value of all minerals produced in Louisiana in 1911, according to the U. S. Government reports, was \$12,710,958. This was an increase of \$2,590,965 over 1910.

Louisiana stands first among the States of Union in the production of sulphur.

First in the production of rock salt.

And eighth in the production of petroleum.

The sulphur is signally pure, assaying over 99 per cent. pure, and is absolutely free from arsenic or selenium.

The Union Sulphur Co., producers of the Highest Grade Brimstone on the market, Whitehall Building, New York, U. S. A., own and operate in Calcasieu Parish, Louisiana, the largest Sulphur Mine in the world; absolutely free from Arsenic or Selenium. The markets of the world are supplied through the port of Sabine Pass, Texas, and the Company has large storage facilities at Baltimore, Philadelphia, New York, Boston, Portland and Three Rivers, Canada, from which the trade can be supplied in car-load lots, as required.

The State of Louisiana also possesses a great variety of other natural resources and advantages which offer a substantial basis for many diversified industries and business enterprises. The State also offers unusual attractions and opportunities to the home seeker who wants to engage in agricultural, market-gardening and kindred pursuits. E. O. Bruner, Commissioner, Louisiana State Board of Agriculture and Immigration, Baton Rouge, La., will be glad to answer any inquiries on these matters, or will refer inquiries to responsible local officials or business men who will furnish the desired information.

# Athens, Georgia: <sup>The</sup> Metropolis of Northeast Georgia

Located on Five Railroads—Distributing Goods All Over The South.

We Want Manufacturers to Locate Here — Both Large and Small.

If interested, write for facts.

Athens Chamber of Commerce

C. C. CALLAWAY, Secretary

## BIG STONE GAP, VIRGINIA

The emporium of Wise county, that mines more coal and manufactures more coke than all the other counties in the State combined; that has immense deposits of fossil iron ores, immense forests of virgin timber, more miles of macadam road than any county in the State, three competitive trunk line railroads—Norfolk & Western, Southern and Louisville & Nashville; offers in cheap raw material and fuel in inexhaustible quantities, unequaled transportation facilities, and her free industrial sites. More inducements to the live, wide-awake business man than any city in the South.

BIG STONE GAP has the largest and finest public school building, the most imposing and costliest Federal building in Southwest, and it has the best churches, the most high-toned, up-to-date and progressive citizenship. Every avenue of business and manufacture is open to the New Comer, together with a warm welcome from an open-hearted and generous people.

RUFUS A. AYERS, President;  
J. H. HAMBLEN, Secretary,  
Board of Trade.

We Have Now On Hand a Few Very Desirable and Paying

## Business Opportunities

City and Country Properties — Seaside Lots and Homes

AND

## Timber Tracts All Over Florida

Ask for a "Tampa Guide"

C. A. HARPER REALTY CO.  
TAMPA, FLA.

## LIVE OAK, FLORIDA

Is a Prosperous, Growing City, situated in the  
Heart of SUWANEE COUNTY

In addition to farm lands, which are fertile, on which staple crops can be raised, we want

## MANUFACTURERS

LARGE AND SMALL

The Chamber of Commerce stands ready to furnish financial assistance to manufacturers who will locate here.

Come to a live, wide-awake, hustling Florida city, which is steadily growing.

Address

W. N. CONOLEY, Secretary  
Chamber of Commerce, LIVE OAK, FLORIDA  
Send for Illustrated Booklet, Free

## SOUTH GEORGIA

Why wait to secure you a home or invest in the best section of the South while the land is in reach of all; we can locate you in good homes or sell you large tracts for Colonies or for Subdivision; the lands are suited to all crops, fruits, pecans, etc. We can place your money at 5% to 6% net to you on first Mortgage improved farms; no better security. Write us.

GEORGIA-FLORIDA LAND &  
INVESTMENT CO.  
TIFTON, GA.

## FLORIDA LANDS

Grapefruit, Orange Groves and Celery Farms  
paying 33 1-3 per cent. per annum

### VILLA SITES

For business men. On hard roads near lake and river. Five acres each for \$500.00; \$100.00 cash, balance \$100.00 per annum. Ideal place to rest, or for hunting, fishing, boating or motoring.

### A COLONY SITE

Of 1000 acres on the St. Johns River. Can sell for \$10.00 an acre; will retail in small farms at \$40.00 an acre.

FOR BLUE PRINTS AND FULL INFORMATION WRITE

WALTER S. ADAMS CO., Inc.

307 Paul Jones Building

LOUISVILLE, KY.



# A MILLION ACRES IN FLORIDA

## Opened For Development By Two New Railroads

Here are opportunities unsurpassed for Land and Colonization Developing Companies—Virgin Timber Lands purchased and held for years. Transportation was the one thing lacking to make them available for Development and it has come with the construction of the Okeechobee Division of the Florida East Coast Railway and the Haines City extension of the Atlantic Coast Line Railway.

### The Haines City Extension

Of the Atlantic Coast Line Railway, from Haines City south, is already in operation forty seven miles to the town of Sebring, which is growing rapidly. It is expected that this line will be continued through to the Caloosahatchee River. We own about 400,000 acres—some in Polk County, but largely in DeSoto County—through which this new road has passed and is planned to pass.

From Lake Childs north the land is high and rolling, covered largely with Virgin Pine, Oak, Hickory and Magnolia. There are a number of clearwater lakes from three to five miles long, with beautiful banks surrounding them, that will make fine sites for winter homes, orange and grape fruit groves and truck farms. The southern portion of the tract is somewhat similar to the lands in St. Lucie County, being very desirable for Colonization purposes.

### The Okeechobee Division

Of the Florida East Coast Railway, from Maytown to Okeechobee, on the north shore of Lake Okeechobee, will open up a magnificent section. The road is already completed 45 miles. The major portion of the grading is completed and the entire road will be in operation within a year. We own 400,000 acres in Osceola and St. Lucie Counties, through which this new railroad runs. These lands border on Lake Okeechobee and Lake Marion and are all virgin pine timber lands that have never been touched by axe or plow. They can be drained through a number of creeks and small streams, that lead to the lakes.

The soil is of a dark, loamy character, well adapted to the growing of citrus fruits, general farming and trucking. The lands in St. Lucie County are largely within the artesian flowing well district. St. Lucie County is the centre of the famous Indian River orange and grape fruit section and some of the finest groves in the State are located near our property.

### 75,000 Acres of Choice Land Touching Tampa Bay

In Hillsboro and Manatee Counties, with several miles of water frontage, are now offered for sale. This tract is interspersed with orange and grape fruit groves and small farms. This is very choice property.

### Valuable Timber

These lands carry a quantity of virgin pine and cypress timber stumpage—ranging from 2500 to 4000 feet, board measure, per acre, in large tracts.

## These Lands at Wholesale Only

The Consolidated Land Company owns over a Million Acres in Florida and the lands described are offered in Tracts of 5,000 acres and up. Bona-fide Prospective Purchasers may secure further information by addressing

## CONSOLIDATED LAND COMPANY

Consolidated Building

JACKSONVILLE, FLORIDA

## JNO. J. AHERN

### City and Suburban Property

Suite 202-04-06

BISBEE BUILDING

### JACKSONVILLE, FLA.

Make a Specialty of Timber and Cut Over Lands  
and Orange Groves

## What Florida Needs

IS MORE INTELLIGENTLY INDUSTRIOUS MEN TO TAKE ADVANTAGE OF THE WONDERFUL NATURAL RESOURCES OF ALL KINDS SIMPLY WAITING TO BE DEVELOPED.

We are fortunate in being able to offer you a selection from Ten Acres upwards of the Finest Tract of Land in Florida, on the Seaboard Air Line Railroad (six trains a day), and having a town (Boyette) already started, with postoffice, store, school and church, sawmill, etc., and joining established and productive farms and groves.

Here at Boyette we are laying out wide streets and planting beautiful shade trees, palms, magnolias, oaks and other graceful species. These improvements, with exceptionally favorable location as to distance from surrounding towns, will make the lots in this place a very choice investment. We offer large lots at from \$20 to \$300 per lot. Farm lands from \$35 to \$100 per acre, in tracts to suit.

We do not sell cheap, poor lands, remote from advantages of civilization. Here we can raise everything—and handy to the markets of the world, with ready means of transportation. Terms \$10 per acre cash and balance \$2 per month, or less a discount of 10 per cent. for all cash.

Besides truck growing, fruit raising and general farming, there will be openings for a creamery, canning factory, ice plant and box factory. We are now making arrangements to have a mill ready for the next season's sugar-cane crop, and will contract to buy the cane at \$1 per ton. As thirty tons per acre is not unusual, you can readily see what a good chance this is.

SUGAR CANE IS ALWAYS A SURE, PROFITABLE CROP, AS EASILY TENDED AS INDIAN CORN. Grows well on new land, and one planting will last several years. The records and statistics prove it a great wealth producer, and the demand for Florida syrup, which is the best table syrup known, far exceeds the supply. The Sugar Cane crop should pay from \$75 to \$125 per acre per year.

THE LAND WILL BE WORTH MORE AS SOON AS IT IS YOURS.

The Tampa Land & Development Co.

AMERICAN NATIONAL BANK BUILDING

TAMPA, FLORIDA

We have a choice tract of 1500 acres adjoining this property on railroad and as an inducement for co-operation in development will sell at a very low price to cash buyer.

T. H. McMILLAN  
President

W. A. McMILLAN  
Vice-President

T. C. HOBBS  
Sec'y and Treas.

## McMillan Realty Company

Capital \$50,000.00

### REAL ESTATE

TURPENTINE AND SAW MILL LOCATIONS

702-4 Bisbee Bldg., Jacksonville, Fla.

We desire to correspond with Eastern Capitalists who would be interested in placing money in Jacksonville Real Estate Mortgages paying 7% and 8% net interest, principal and interest guaranteed by us.

#### REFERENCES

FOURTH NATIONAL BANK  
Jacksonville, Fla.

FLORIDA NATIONAL BANK  
Jacksonville, Fla.

BOARD OF TRADE  
Jacksonville, Fla.

McMILLAN BROS.  
Savannah, Ga.—Jacksonville, Fla.



## Better Than Stocks and Bonds

Is an Investment in Real Estate in  
Jacksonville, Fla.

Jacksonville has a population of 80,000. Increase in ten years 103 per cent. Number of buildings erected in the past eleven years is eleven thousand.

Real Estate investments in Jacksonville pay from 8—15 per cent., in addition to a rapid increase in value. Let us submit something good.

We can lend your surplus in sums of \$2000 up at from 6½—8 per cent. net to you.

We own Choice Farming Lands. Write

### RALEY-HAMBY COMPANY

INCORPORATED \$300,000

117-118-119 Heard Bank Bldg.

JACKSONVILLE, FLA.

Members

Board of Trade Real Estate Exchange Southern Commercial Congress

Reference: Barnett National Bank of Jacksonville, Fla.

## VIRGINIA-VIRGINIA-VIRGINIA

AND  
NORFOLK, VIRGINIA

Is the best of all places to come

Farms are as good and prices as reasonable—and climate for all the year the best. With the Panama Canal and the inland waterways opened, Norfolk will be one of the greatest beneficiaries—then why not come to Norfolk, now, before prices advance? Send for our lists, which are free.

H. C. HOGGARD & CO.

NORFOLK

VIRGINIA

## GROGG AND DUDLEY

PURCHASERS

OWNERS

— AND —  
SELLERS

Coal, Timber and Farm Lands in West  
Virginia, Kentucky, Virginia

205 FOURTH STREET

PARKERSBURG, W. VA.

### RALPH O. COCHRAN COMPANY

74-6-8 Peachtree Street

ATLANTA, GA.

We buy and sell real estate, we conduct a general renting business, we negotiate first mortgage loans. Anyone wishing any information along these lines, or if we can do any business with you, we will be glad of the opportunity and will appreciate hearing from you.



Cheap Electric Power

Ideal Factory Sites

Tax Exemption Five Years

Shipping Facilities "A-1"

Water-Works and Sewerage

Board of Trade - - CHERAW, S. C.

## FOR SALE

About 200 foot front on Eleventh Street by 135 foot deep, near center of city (5 blocks from Market Street), adjoining Southern R. R. and running back to Belt R. R.

— ALSO —

Block about 350 x 350 feet, just across Eleventh Street from above property. Fine Warehouse, Store or Factory Locations. The latter property partially improved and paying about \$3,000 per annum.

Very Easy Terms.

W. B. MITCHELL

KEYSTONE BLOCK

CHATTANOOGA, TENN.

## A Great Investment Opportunity In Southern Real Estate

17,000 acres rich virgin land, sandy loam soil, on main line Seaboard, at McBee, S. C., 60 miles north of Columbia, S. C. In famous Pinehurst health zone, no malaria, no swamps, no waste land, perfect natural drainage, 500 feet above sea level, practically ready for cultivation, three railroads through property, only 18 hours to New York; endorsed by Commissioner of Agriculture of South Carolina.

The soil is ideal for truck, berries, watermelons, canteloupes, peaches, grapes, plums, pecans. The adjoining county holds world record for corn—256 bushels per acre; also the banner cotton county in the South.

Will subdivide or sell as whole.

Address

SOUTHERN LAND DEVELOPMENT CO. (Owners)

LAURENS, S. C.

## Atlantic Coast Realty Company GREENVILLE, N. C.

We Get the Highest Prices  
for Real Estate Everywhere

City and Suburban Lots, Farm and Timber Lands Bought and Sold.  
We can furnish your every need in the Real Estate Line.

AUCTION SALES OUR SPECIALTY

All deeds, notes and other papers are prepared free of cost at the close of every sale. Have us sub-divide your farm into small tracts and sell it to the highest bidders.

Atlantic Coast Realty Co.,

Greenville, N. C.

"The Square Deal Company"

## If Interested In BIRMINGHAM ALABAMA

Address your inquiries as to the real estate situation, rental space in modern office buildings, choice business locations, investment opportunities, etc., to us. Our thorough knowledge of the city and our active connection with its development for many years qualify us to give you correct information and sound advice.

"Our Business," a handsome, meaty booklet, also booklet "Corey, The Model Industrial City," should be in your hands. Write for them.

## JEMISON

Real Estate and Insurance Co.

211 NORTH TWENTIETH STREET

GROUND FLOOR, FIRST NATIONAL BANK BLDG.  
BIRMINGHAM, ALA.

## IF YOU KNEW OF A COUNTY

Where the farmers produced and sold above their own consumption last year—

25,000,000 pounds cotton, market value of.....	\$3,250,000.00
2,400,000 dozen eggs, market value of.....	480,000.00
50,000,000 pounds cottonseed, market value of.....	500,000.00
10,000 head cattle, market value of.....	250,000.00
1,000,000 pounds butter fat, market value of.....	200,000.00
50,000 turkeys, market value of.....	120,000.00
6,000 head hogs, market value of.....	100,000.00
1,000,000 pounds chickens, market value of.....	80,000.00
1,000 horses and mules, market value of.....	75,000.00
50,000 bushels corn, market value of.....	30,000.00

\$5,085,000.00

THAT has a population of 30,000 men, women and children, ten thousand of which make up the towns, leaving the balance, or 20,000, of its population on the farms—computing by statistical average of 5 to the family will leave 4000 farmers producing the above wealth, an average of about \$1260 PER FARM, which makes an earning capacity of \$250 PER YEAR FOR EVERY MAN, WOMAN AND CHILD ON THE FARMS OF THIS COUNTY.

THAT has good Banks, Wholesale and Retail Mercantile Businesses, well situated in their own buildings, and well officered by honest and capable men;

THAT is situated in the rain belt, the climate being mild and healthful; WHERE the people are good, thrifty, law-abiding citizens, the most of whom are Germans and Bohemians;

WHERE excellent schools and churches are in every part of the county;

WHICH lies half way between San Antonio and Houston, with good mail and telephone service throughout its 992 square miles;

WHICH has excellent shipping facilities—three good Railroads traversing it, each of which is represented by many stations;

WHICH contains black hog-wallow land, and a sandy loam, peculiar to this section, and which is very productive of the classes of crops best adapted to this county, which are corn, cotton, cane, potatoes, all varieties of fruits, and truck of all kinds;

WOULDN'T YOU BE INTERESTED IN WRITING TO

JNO. A. KERR

209 Frost Bldg., San Antonio, Tex.

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Santo Domingo Land and Irrigation Co.	1-20" unit
Louisiana Rio Grande Canal Co.	1-30" unit
Louisiana Rio Grande Canal Co.	1-36" unit
Louisiana Rio Grande Canal Co.	2-60" units
Garwood Irrigation Co.	1-36" unit
San Jacinto Rice Co.	1-36" unit
Louisiana Meadows Co.	2-48" units
Harlem Plantation	1-24" unit
Compania Agricola del Rio Bravo	4-60" units
Compania Agricola del Rio Bravo	1-36" unit



Photo Copyright by H. J. Harvey, N. O.

Pumping Plant No. 1, Avoca Drainage District near Morgan City, La. Equipment: 1-48 in. Worthington Pump direct connected to Cross Compound Hamilton Corliss Engine. Deane Jet Condenser. Babcock & Wilcox Boiler. Weber Reinforced Concrete Chimney. Lockett Fuel Oil Equipment.

The above slightly understates the facts as since it was written the total has been brought up to 1,192,000 GPM. This is equivalent to a flow of 2,648 cubic feet per second, or if stated as is customary with waterworks pumping plants, is a combined capacity of 1,716,000,000 gallons per day.

These plants pump against heads of from five to fifty feet.

The combined horse power is 10,318.

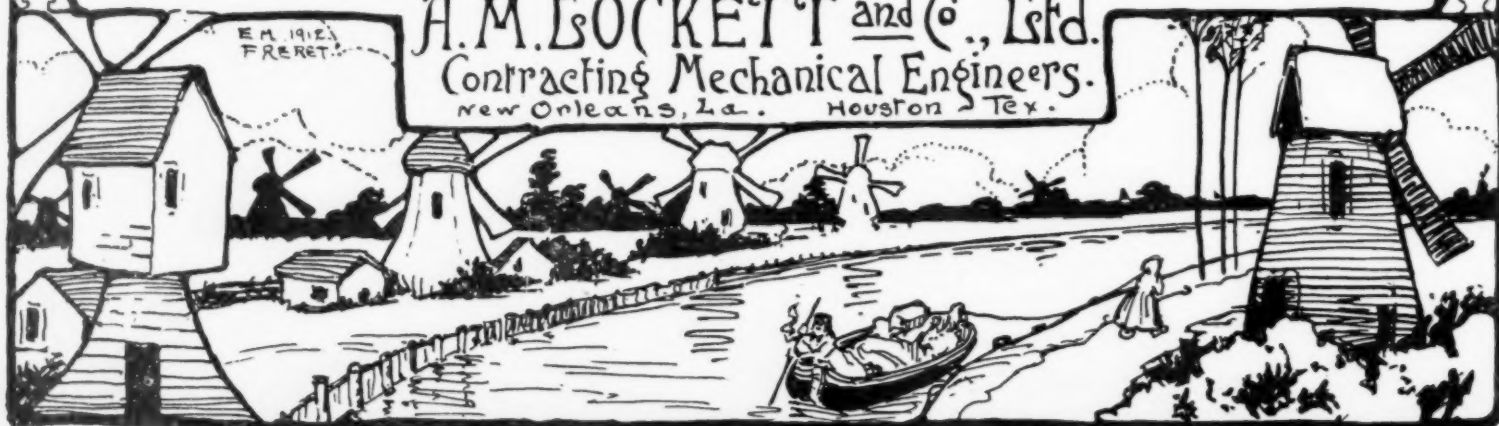
The annual cost of fuel varies from 15 cts. to \$1.15 per acre, depending upon the lift, size of plant, crop, etc.

A number of these plants are located where gravity irrigation would be possible, but it is better engineering and more true conservation to spend this amount for fuel than to put in expensive dams on which the interest alone would amount to a greater annual tax per acre.

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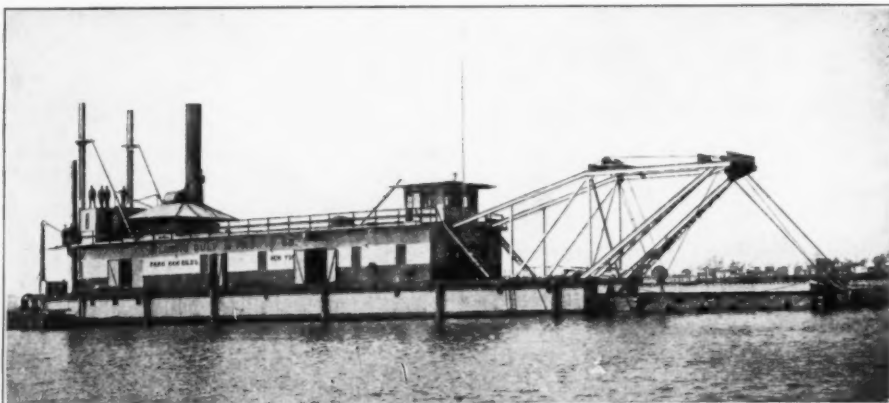
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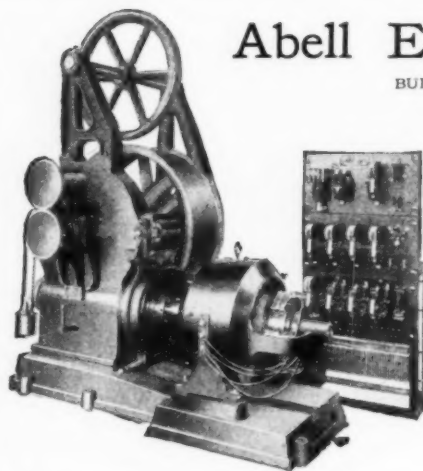
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- 2—Richmond Hotel, Richmond, Va.  
John Kevan Peebles, Architect.
- 3—First National Bank Bldg., Richmond, Va.  
Alfred C. Bosson, &  
Clinton & Russell, Associate Architects.
- 4—Hotel Paso del Norte, El Paso, Texas.  
Trost & Trost, Architects.
- 5—American Trust & Savings Bank Bldg., Birmingham, Ala.  
Mowbray & Ullinger, } Associate Architects.  
W. L. Welton, }

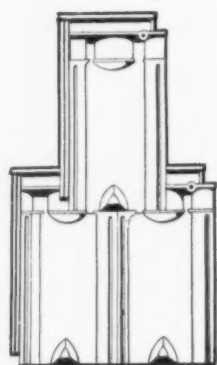
- 6—Adolphus Hotel, Dallas, Texas.  
Barnett, Hayes & Barnett, Architects.
- 7—Southwestern Life Insurance Bldg., Dallas, Texas.  
Lang & Witchell, Architects.
- 8—Brown-Marx Bldg., Birmingham, Ala.  
Wm. C. Weston, Architect.
- 9—Savannah Bank & Trust Co., Savannah, Ga.  
Mowbray & Ullinger, Architects.
- 10—Heard Building, Jacksonville, Fla.  
John Kevan Peebles, Architect.

## OTIS ELEVATOR COMPANY

Eleventh Avenue and Twenty-sixth Street  
NEW YORK

OFFICES IN ALL PRINCIPAL SOUTHERN CITIES.





## DOUBLE-INTERLOCKING ROOFING TILE

MANUFACTURED BY

THE NATIONAL ROOFING TILE COMPANY

LIMA, OHIO, U. S. A.

SOUTHERN REPRESENTATIVES

ROPER & STRAUSS CO., 702 Forsyth Building, ATLANTA, GA.

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Our orders in January, 1913, will more than double any January since we have been in business. A large part of these orders are from people who have used our elevators before.

We believe we are not only keeping up with the procession, but that we are some distance in the lead in the way of latest and most improved and Fool Proof Elevators.

We can give you anything in the elevator line.

PRICES REASONABLE.

Moffatt Machinery Manufacturing  
Co.

CHARLOTTE, N. C.



The one really safe

## Fire Escape

For schools, asylums, hospitals, etc.

### The Kirker-Bender Spiral Slide

More than 200 people may slide through it each minute with absolute safety.

Covered by eight patents. In use all over the United States.

Dow Wire & Iron Works  
INCORPORATED

LOUISVILLE, KY.

## It Has No Equal

For Concrete Work, Roofing, or  
Road Building

THE various sizes of Blast Furnace Slag produced by us, for uses above specified, are not only far superior to stone or gravel, but much cheaper. Slag shows a much greater crushing strength.

LET us have an opportunity of proving these facts to you through reports obtained by unquestioned sources, such as are recognized authorities the world over.

WE are the largest shippers of Blast Furnace Slag in the United States.

Slag is impervious to moisture.

BIRMINGHAM SLAG COMPANY

BIRMINGHAM, ALA.

## AMERICAN ELEVATORS

INSTALLED  
EVERYWHERE

NINE IN OPERATION IN THE SOUTHERN RAILWAY BUILDING, INCLUDING BOTH HIGH SPEED PASSENGER AND HEAVY DUTY FREIGHT TYPES.

The Ansley Hotel, Atlanta, has three Tandem Traction Type; the Hotel Washington, Indianapolis, has two; the Katy Office Building at Dallas has two, and the State Capitol, Des Moines, Iowa, has two.

AMERICAN MACHINE CO., Louisville, Ky.

NOT IN THE TRUST



FREIGHT HOUSE

SOUTHERN RAILWAY CO.'S OFFICE BUILDING AND DEPOT, Atlanta, Ga.

OFFICE BUILDING



ROANOKE PLANT

# VIRGINIA

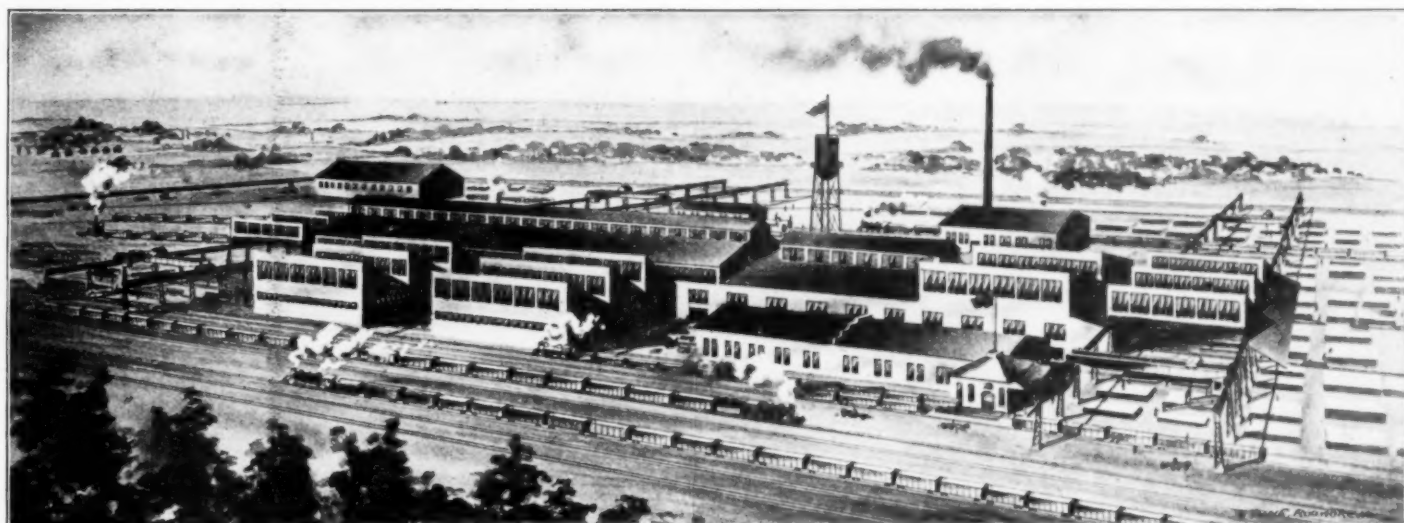
Bridge and Iron Company

General Offices - ROANOKE, VA.

Contracting Offices: Atlanta

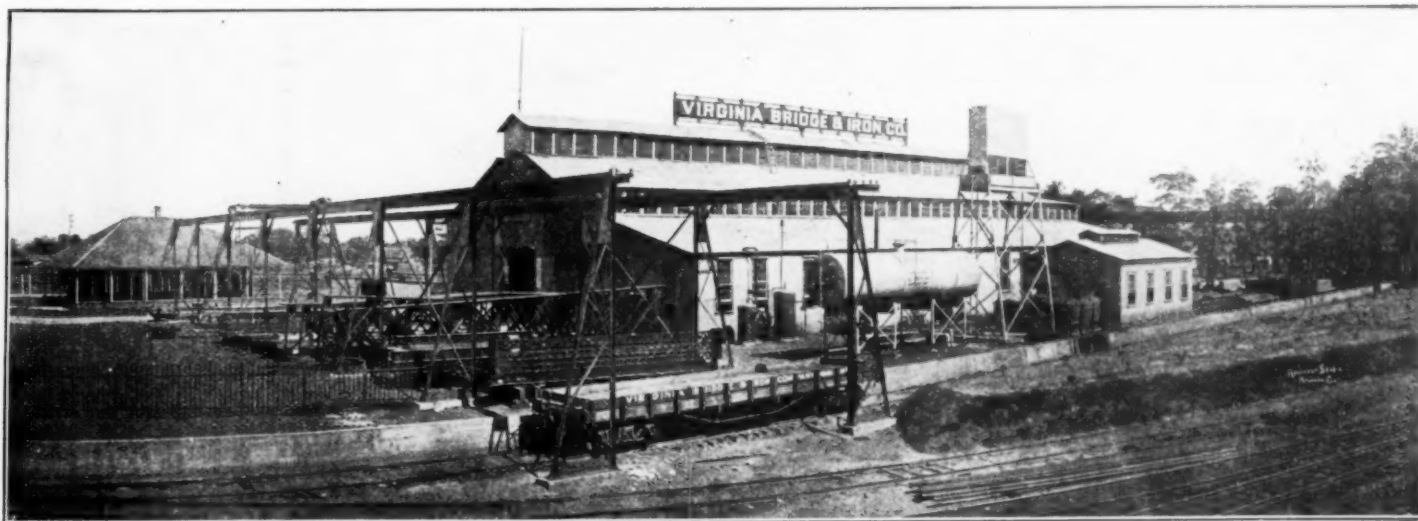
Memphis

New Orleans



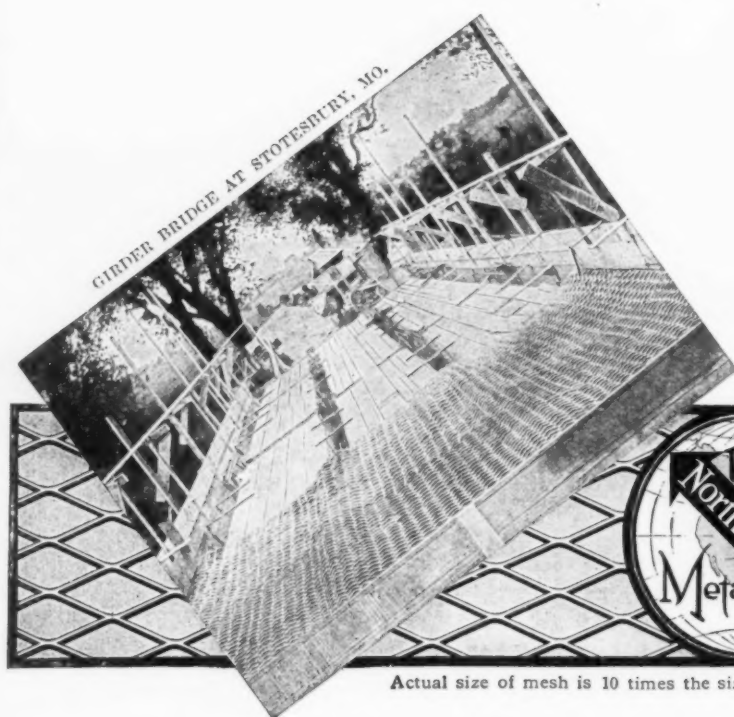
MEMPHIS PLANT

The Works that have produced the longest Bridges, the tallest Buildings and many of the largest Industrial Structures in the South during the past twenty years



ATLANTA OFFICE AND PLANT—Beam and Stock Yard in Rear





# THESE 4 STAND FOR Expanded Metal



Actual size of mesh is 10 times the size of this mesh



## Econo Steel Reinforcing

### Talk is Cheap—Poor Reinforcing is Costly

No matter what the construction—sewer work, bridge flooring, factory buildings—ECONO STEEL REINFORCING is the strongest and most durable concrete reinforcement that you can buy.

No one has time for "hot air" and generalities, but every business man is alert when "Economy" and "Efficiency" are mentioned. Here are a few hard hitting reasons why ECONO STEEL REINFORCING is "BEST:"

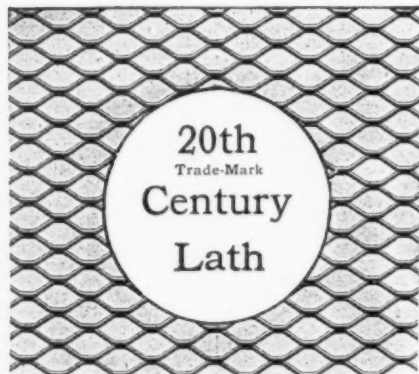
1. The "Diamond Mesh" of ECONO STEEL REINFORCING distributes the load instead of allowing one or two bars to carry it all, as in bar construction.
2. ECONO STEEL REINFORCING is made by a process which "draws" the strands, producing results similar to the "drawing" of steel wire. This adds to its strength without making it brittle, as Econo is manufactured from medium carbon steel.
3. One man can lay ECONO STEEL REINFORCING, because it comes in flat, non-curling sheets that can be put down without tying, stapling or spacing.

## XXth Century Metal Lath

(ACID RESISTING)

### The Lath that Lasts

There are many reasons why 20TH CENTURY LATH is best by test of time and service.



1. It is made from U. S. Standard Gauge Sheets.
2. It never disintegrates.
3. The plaster "Keys" to the mesh so tightly that it never comes off.
4. Furnished coated with best grade of electrolysis-proof carbon paint.

## NORTH WESTERN EXPANDED METAL CO.

907 Old Colony Building, Chicago, Ill.

Largest Exclusive Manufacturers of Expanded Metal in the World

### THESE DEALERS HANDLE OUR GOODS IN YOUR LOCALITY

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EL PASO, TEXAS.  
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FORT WORTH, TEXAS.  
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F. Codman Ford.  
J. J. Clarke Co.  
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Dehler Bros.

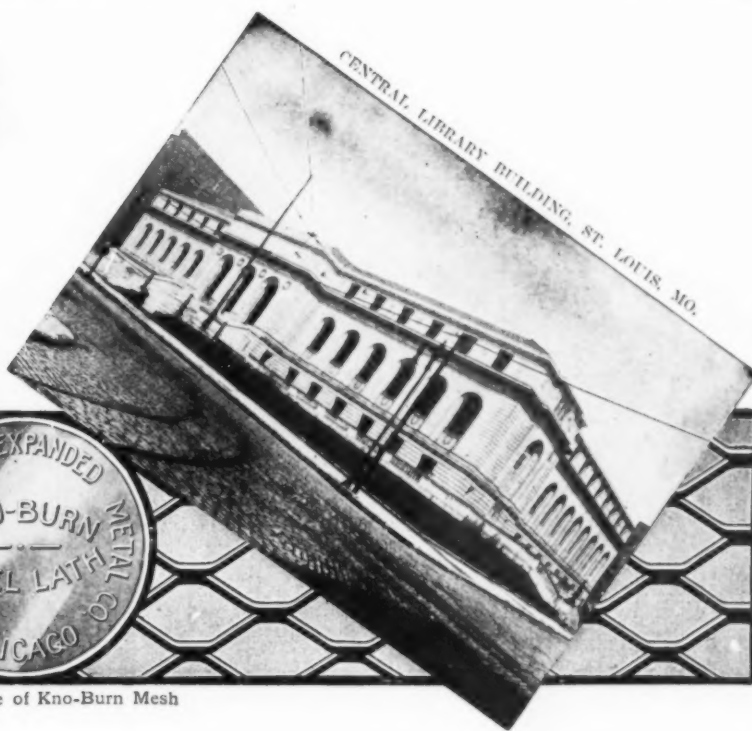
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# PRODUCTS

## THE BEST IN Construction



Actual size of Kno-Burn Mesh



## Kno-Burn Metal Lath

### Its the Mesh that Makes the Plaster Stick

No matter whether it is used on big public buildings or on private residences, KNO-BURN METAL LATH never comes off.

The plaster is literally "keyed" to the mesh. Here are a few more of the many points of superiority that give KNO-BURN METAL LATH its pre-eminence:

1. KNO-BURN METAL LATH does not sag or buckle. It can be used on 16" center spacing of studding.
2. KNO-BURN METAL LATH has no corrugations or ribs. This makes the application of the plaster easy and the imbedment of the lath certain.
3. KNO-BURN METAL LATH is made from United States Standard Gauge sheets and is shipped plain, coated with electrolysis-proof paint, or *galvanized after expansion* with highest grade of prime Western Spelter.
4. KNO-BURN METAL LATH is absolutely fire and weather proof.

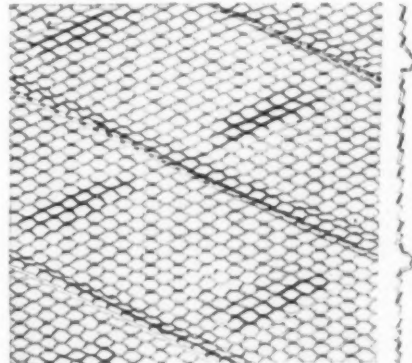
## Kno-Fur Metal Lath

(NO FURRING STRIPS)

### It's the "U"-Shaped Rib

KNO-FUR EXPANDED METAL LATH is the practical result of a big idea.

1. It makes furring strips unnecessary.
2. Its "U"-shaped rib imbeds itself in the plaster with equal ease whether plastered on one or both sides.
3. The meshwork ribs are small trusses similar in construction to a steel bridge truss. This gives extreme rigidity and permits of 24" center spacing.
4. It is acid resisting, and cut from U. S. Standard gauge sheets.



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Batchelder & Collins.

#### RICHMOND, VA.

Southern Steel Products Co.  
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#### JACKSONVILLE, FLA.

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#### WILMINGTON, N. C.

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**NORTH WESTERN EXPANDED METAL CO.**

907 Old Colony Building, Chicago, Ill.

Largest Exclusive Manufacturers of Expanded Metal in the World



## The Reinforced Concrete Cotton Warehouse Affords Maximum Concentration of Cotton Values



Nearly thirty-five acres of reinforced concrete buildings make the plant of the Memphis Terminal Corporation one of the largest cotton plants in the world. Concrete construction made possible this immense concentration of cotton values by segregating the values and securing the lowest possible insurance rate. These buildings have been constructed at different times—partly by the owners and partly by contractors. The last addition of some fourteen acres of buildings was just completed by the General Unit Construction Company.



Over two million square feet of "Unit-Bilt" reinforced concrete buildings demonstrate the accuracy, strength and attractive appearance produced by "Unit-Bilt" methods. Among these structures are the largest fireproof cotton mill in the Southwest, one of the largest electric car barns in the world, railroad round-houses, factories and warehouses for many large corporations.

We solicit inquiries from architects, engineers and owners.

## UNIT CONSTRUCTION COMPANY

Engineers and Contractors

724 CHESTNUT STREET, ST. LOUIS, MO.

New York

Chicago

Houston

San Francisco

Mexico City



Carleton Shirt Factory, St. Louis, Mo.



Interior View of Same

The SUNLIGHTNESS,  
FIREPROOFNESS  
ECONOMY and  
TIMEPROOFNESS

of  
**Fenestra**  
SOLID STEEL WINDOWS

For TEXTILE MILLS,  
SILK MILLS,  
COTTON MILLS,  
WOOLEN MILLS,  
BLEACHERIES

## The Right Illumination of Modern Mills

The world moves apace. And in nothing has there been truer advancement than in mill construction.

The mills of other days were, as a whole, insanitary, short-lived, poorly lighted—with wooden sashes that invited fire, that helped spread fire, that burned like tinder.

How many mill owners, uninsured, or poorly protected, have seen their plants go up in a single night because of the old-fashioned wood sash which was no protection from flames either within or without!

The mill of the New Century shows forethought and protection in every portion of its design and equipment.

Particularly are the *windows* looked to.

Fenestra Solid Steel Sash has demonstrated its convenience, true economy and safety in leading mills and factories all over the country.

Textile institutions require light. Not

stray shafts of light, but a flood of illumination. It means better, healthier workers. It means prevention of accident. It means saving through mistakes, which are absolutely impossible to prevent in poorly lighted workrooms.

Fenestra Walls not only let in the sunlight and cheer of the great outdoors. They mean clear-eyed, ambitious workers. They pay for themselves in increased loyalty—increased willing productiveness of your mill people. They have wonderful lasting quality that make them far cheaper in the end than the old style sash.

We carry in stock a range of interchangeable bars which embrace 300 standard types and sizes. This simplifies every detail of your building operations, and is welcomed by every painstaking architect.

Let us send you our new Textile Mill Folder. We will also be pleased to give you advice proven by a long experience in modern mill lighting as well as to be of assistance to your architects and engineers

**DETROIT STEEL PRODUCTS COMPANY**

Department M, Detroit, Michigan

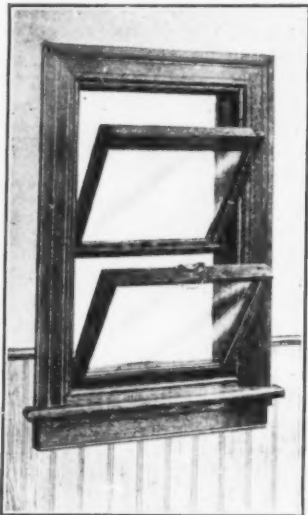


# The Richmond Adjustable Window

The Perfection of Window Development  
Meets Every Conceivable Demand

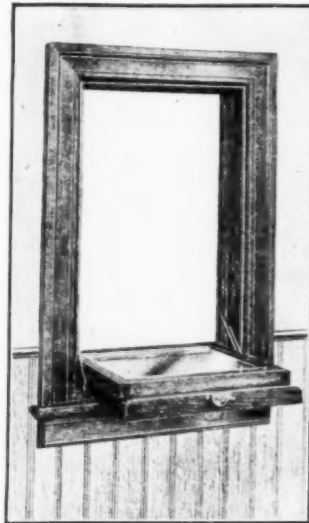
Adapted to any kind of building—office, industrial, residential, etc. Some of its vital advantages are satisfactory ventilation in bad or good weather, facility for cleaning and burglary protection, and with all it is just as simple in operation as the ordinary window.

The following installations show that its adaptation to various buildings is unlimited:



DIFFUSED VENTILATION, ANY  
DESIRED PER CENT.

The Times-Dispatch Building.....	Richmond, Va.
Shepherd's Ice Cream Factory.....	Richmond, Va.
W. A. Chesterman's Office Building.....	Richmond, Va.
Kain's Flat Building.....	Richmond, Va.
Five Residences, Shepherd and Grace Streets.....	Richmond, Va.
Office of the Health Department.....	Richmond, Va.
Allen & Ginter Office.....	Richmond, Va.
Chamber of Commerce.....	Richmond, Va.
Bellevue School.....	Richmond, Va.
Dr. Chas. Labenberg's Residence.....	Richmond, Va.
M. L. Isbell's.....	Richmond, Va.
International Harvester Co.'s Office.....	Richmond, Va.
I. Kaufman's Residence.....	Richmond, Va.
Manufacturers Record Building.....	Baltimore, Md.
Colorado Building.....	Washington, D. C.
Office of the Supervising Architect of the United States.....	Washington, D. C.
Sibley Hospital.....	Washington, D. C.
Stevens Public School.....	Washington, D. C.
M. J. Fadeley's Residence.....	Lakeland, Fla.
S. R. Weems' Residence.....	Dallas, Tex.
State and City Hospital.....	Dallas, Tex.
Beech Grove Hospital.....	Indianapolis, Ind.



SHOWS HOW EASILY BOTH  
SASHES CAN BE WASHED  
FROM THE INSIDE.



THE NEW HOME OF THE MANUFACTURERS RECORD IS EQUIPPED WITH THE RICHMOND WINDOWS.

Everyone interested in windows and ventilation will be interested in the Richmond Window. Our illustrated catalogue will be gladly sent on request. It explains the window in detail.

**National Adjustable Window Corporation**  
RICHMOND, VIRGINIA

# Atlanta Steel Company

MANUFACTURERS OF

## Open Hearth Steel Products

Round, Square and Square Twisted Reinforcing Bars,  
Hoops, Bands, and Cotton Ties

Wire Nails, Barb Wire, Market Wire, Plain and Galvanized Wire,  
and Woven Wire Fencing

WE CARRY LARGE STOCKS AND MAKE QUICK SHIPMENTS  
Send us your inquiries and orders. Our prices are always right

WRITE US ABOUT STEEL BARS FOR CONCRETE REINFORCEMENT  
SHIPMENT FROM STOCK

**ATLANTA STEEL CO., ATLANTA, GA.**

We Design  
Fabricate  
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Stairways	Gates
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Fire Escapes	Doors
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Also, STRUCTURAL STEEL AND CAST-IRON  
WORK OF EVERY DESCRIPTION

We are at all times pleased to  
furnish designs and estimates

**Chesapeake Iron Works**

BALTIMORE, MD.

HOT

CAN BE  
REMOVED

Rose Top

GUARANTEED  
WE MAKE  
THAT STAND

**Danzer Metal Works**



AIR

READILY  
BY USING

Ventilators

WATERTIGHT.  
TINNERS' TOOLS  
THE TEST.

West Lee Street  
HAGERSTOWN, MD.

Nickerson Patent Double Lock Joint

## COLUMNS

Porch

Interior

Pergola

BUILT TO STAY

and  
ARCHITECTURALLY CORRECT

OUR HOBBY—First-class Columns at Right Prices. Send list of  
your needs and let us quote you prices.

BOOKLET FREE

Our Factory is the Home of Good Columns  
Also all kinds of Interior Trim to detail

**Nickerson Manufacturing Co.**

KNOXVILLE, TENN.





WESTERN UNION, TELECODE AND A B C CODES USED.

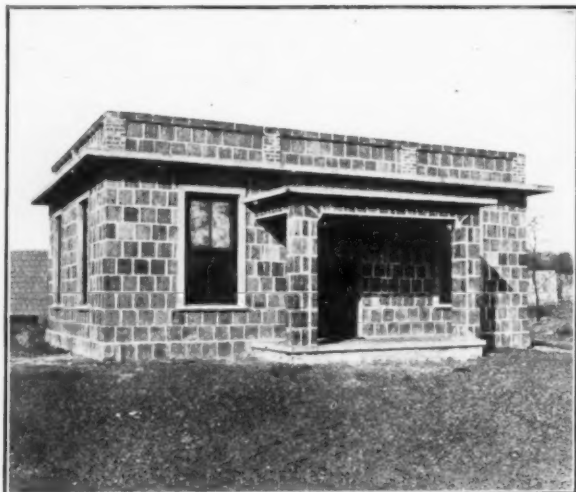
CABLE ADDRESS "WOOD"  
TELEPHONE CONNECTIONS.

TRADE MARK  
  
 SALES OFFICE,  
 6TH FLOOR ROOMS NO 609 TO 12  
 CONTINENTAL BUILDING.

**R.E. Wood Lumber Company**  
 MANUFACTURERS AND DEALERS IN  
**HARDWOOD LUMBER.**  
*Baltimore, Md.*

MILLS:  
 WEST VIRGINIA.  
 TENNESSEE.  
 NORTH CAROLINA.

FIREPROOF OFFICE BUILDING ERECTED  
 — OF —  
 HOLLOW TILE FIREPROOFING



The above office building of the North Birmingham Fire Brick & Proofing Co. of Birmingham, Ala., erected of hollow tile manufactured by them. This building is ABSOLUTELY FIRE-PROOF, as there is not a piece of wood in the construction—the doors and windows are metal—while the floors are of ceramic tile—the building is steam heated.

For office buildings and residences there is no better material than HOLLOW TILE FIREPROOFING. Handsome catalogue will be mailed to responsible parties upon request.

Address

North Birmingham Fire Brick & Proofing Co.  
 BIRMINGHAM, ALA.

WHOLESALE—RETAIL  
**SASH, DOORS, BLINDS**  
 PLATE AND WINDOW GLASS

TILE  
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Successors to FRANK T. CLARK CO., Ltd.

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Ask your dealer for the "KAUL KIND"

FRAMING  
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# Massee & Felton Lumber Co.

## MACON, GA.

Own and Operate a Large Modern Band Saw Mill  
with Band Resaw,

CUTTING FIFTEEN MILLION FEET  
Hardwood Lumber Per Year,

Specializing on

RED GUM, Plain and Quarter-Sawed,  
ALSO  
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Dry Stock List and Quotations on  
Application

===== ALSO MANUFACTURE =====

GUM TRIM and Moldings  
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In Stock Lengths or Cut Lengths

Either Machine Sanded, or Plain

===== Machine Run. =====

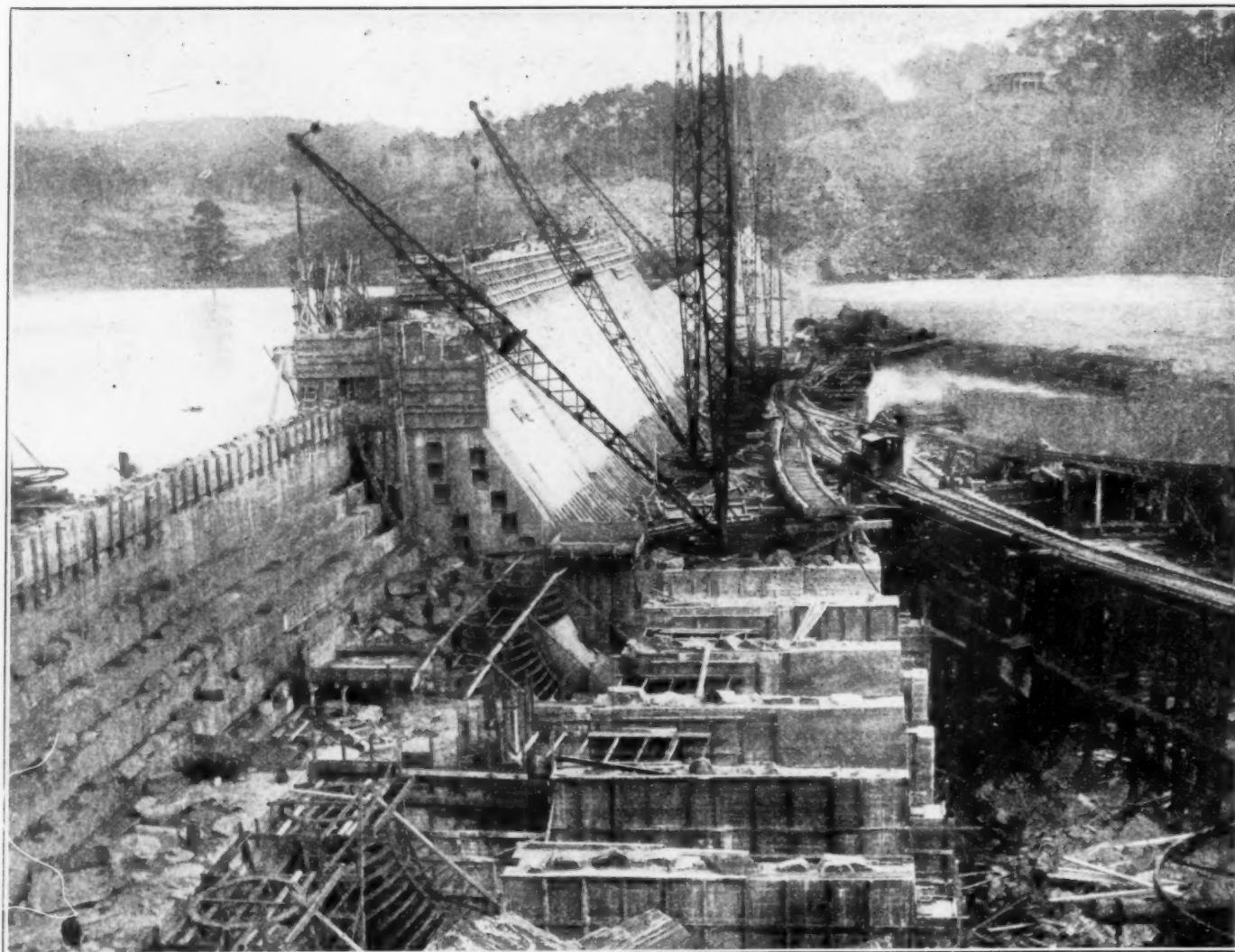
Get Our Prices and See Our Stock Before You Buy

MILL AND OFFICE

## MACON, GA.



Progress Photograph of Goat Rock Development of the Columbus Power Company, Columbus, Ga.



150,000 Bbls.

**“STANDARD”**

Portland Cement

Used in Construction

## A FEW OTHER IMPORTANT USERS OF STANDARD PORTLAND CEMENT

T. C. I. & R. R. Co., Ensley, Ala.	300,000 Bbls.
L. & N. Ry. Co.	100,000 “
Ala. Power Co.	120,000 “
So. Ry., C. of Ga., I. C. Ry., A. G. S.	
Ry., S. A. L. Ry., A. C. L. Ry.	150,000 “

THE STANDARD OF THE SOUTH

Manufactured by

**Standard Portland Cement Co.**J. I. McCANTS  
Sales Mgr.Sales Office  
BIRMINGHAM, ALA.Works  
LEEDS, ALA.



# CLINCHFIELD



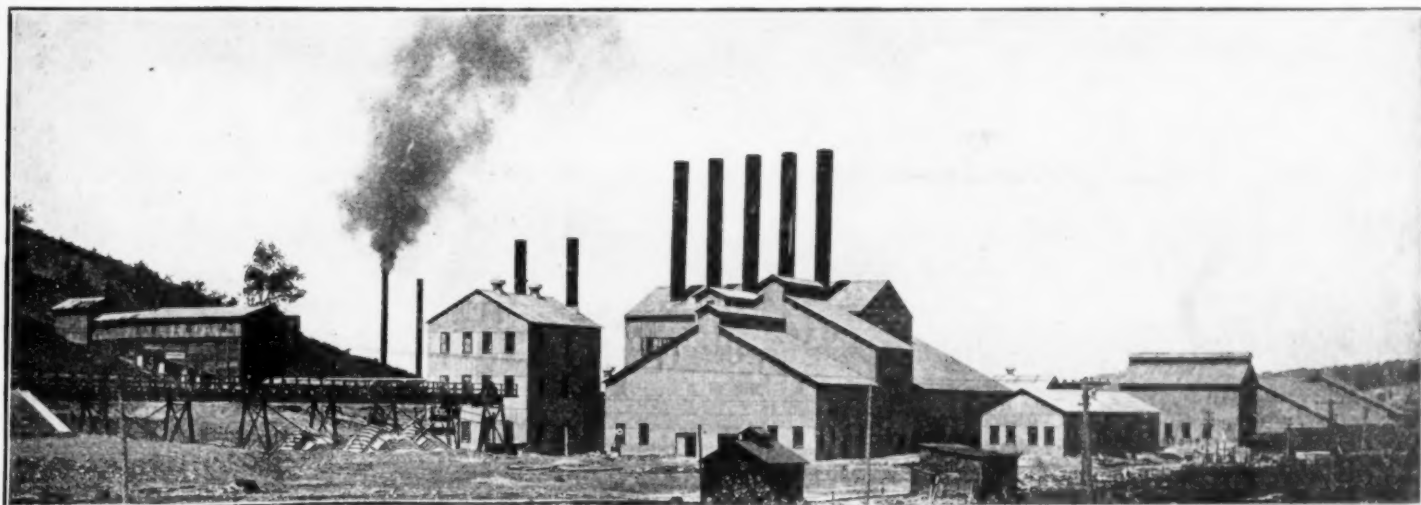
THE ACKNOWLEDGED  
NEW STANDARD OF THE SOUTH

## A GENUINE PORTLAND CEMENT

Unexcelled in Quality

Uniform in Color

High Tensile Strength and Durability



CAPACITY DOUBLED

Over 500,000 Bbls. Being Used in 3 Dams

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Accepted by the Most Exacting Engineers

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### Clinchfield Portland Cement Corp'n



OFFICE AND MILLS

KINGSFORT, TENN.

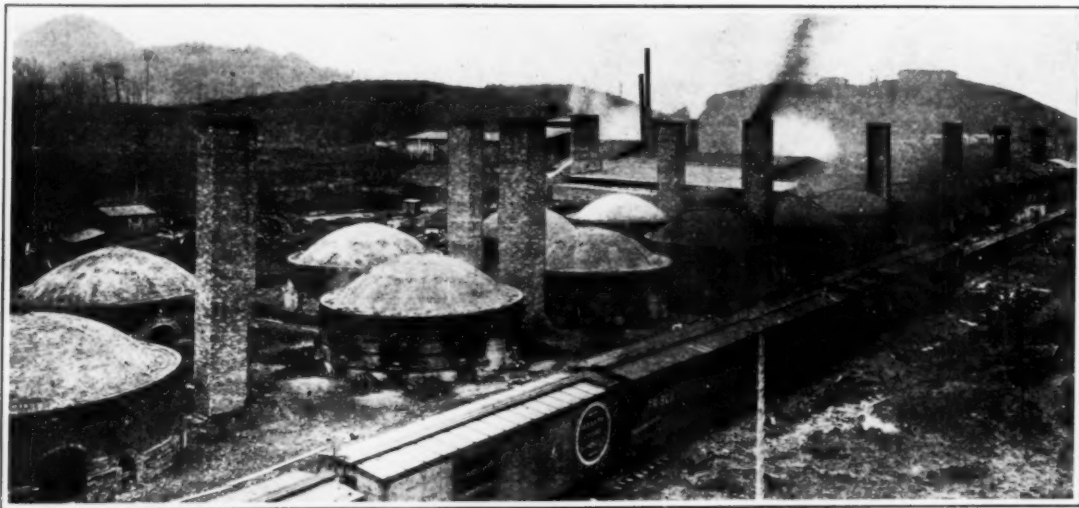




# Tennessee's Foremost Brick Plant

ON THE CLINCHFIELD RAILWAY

DAILY CAPACITY 100,000



## KINGSPORT BRICK: The New Standard of the South

### A Standard Shale Brick

Minimum moisture absorption. Large size and side cut: affording best surface for mortar. All hard and of greatest density and strength. Least breakage in transit and handling.



Central Baptist Church, Johnson City, Tenn.

RECENT STRUCTURES  
BUILT OF  
KINGSPORT  
SELECTED RED BRICK



Marion College for Women, Marion, Virginia

### KINGSPORT STEELITE

A VITRIFIED BRICK IN GRAY AND DARK STEEL HARMONIES; A  
MOST BEAUTIFUL BRICK FOR FLEMISH BOND CONSTRUCTION

### KINGSPORT SELECTED REDS

A DISTINCT ADVANTAGE IN FORM AND BEAUTY  
OVER PRESSED BRICK AND AT LESS COST.

### KINGSPORT RUFTEX

PERSIAN RAINBOW COMBINATIONS:  
ARTISTIC EFFECTS AND VERY POPULAR.

PROMPT DELIVERIES

SAMPLES ON REQUEST

## KINGSPORT BRICK CORPORATION

JOHNSON CITY, TENN.

# Five Good Reasons Why You Should Use Brick For That New Home You Are Going to Build

## No. 1—The Beauty of a Brick House

- (a) The colors of Brick are unique.
- (b) The variety is almost endless: reds, pinks, browns, buff, purples, blues, mottles, etc., of all shades.
- (c) These colors are permanent.
- (d) They are burned into the clay by intense fire.

## No. 3—The Charm of a Brick House

- (a) A good Brick House gathers charm with age.
- (b) A Brick House never blisters, settles or rots. It stands firm and unshaken as the years roll by. It defies the elements; the walls mellow and soften in color. The ivy creeps over the surface. The house blends with the trees, the flowers, the green grass around it. It seems to be a part of nature's own handiwork. It takes on a charming old age.
- (c) A Brick House never looks old. Some of England's brick houses were built over 300 years ago, yet they are more beautiful today than ever.

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## No. 2—The Dignity of a Brick House

- (a) Houses of Brick command respect.
- (b) It looks substantial and permanent. There is nothing temporary about the appearance of a Brick House.
- (c) It says to every passerby:  
"I am of Brick. I am built of honest material, well put together. I am not a sham or an imitation of anything. I am made to last."

## No. 4—The Brick House as an Asset

- (a) The Brick House beautiful to look at, comfortable to live in, easy to heat, free from excessive repairs and depreciation and not easily burned down, cannot fail to be a good asset.
- (b) The rich man builds his palace, the poor man his cottage. Both look on the investment as "an anchor to windward" protecting the family from the cold winds of winter, and the adverse winds of Fortune.
- (c) Either man or both may desire some day to sell his house. If he has chosen his Building Material wisely, his house will be a good asset quickly turned into cash, otherwise it will be a liability, "a drug on the market."

## No. 5—The Cost of a Brick House

Most people think that Brick is "too expensive." This is the greatest mistake of all. The price of lumber has advanced until a house can be built with 8-inch solid brick walls for only a slight extra cost over frame.  
Not over 6 per cent. to 8 per cent.  
The difference is soon wasted by the painting and excessive repairs on a frame house.  
In a short time the Brick House has cost less than wood. We have the figures and can prove it.  
However much the relative cost of brick and wood may vary in different localities, this basic principle is true practically everywhere.  
The first cost and maintenance of a wooden house sooner or later exceeds the first cost and maintenance of a Brick House.

# Sibley-Menge Brick & Coal Company

Home Office, Brown - Marx Building  
BIRMINGHAM, ALABAMA

AGENCIES IN ALL LEADING CITIES OF THE SOUTH ATLANTIC AND GULF STATES



## Wire Rope Efficiency

Due to correct combinations of material and construction, and by careful study of the various working conditions we are prepared to furnish wire rope for any service that will give maximum results.

For heavy duty we recommend our *red* strand



This grade of rope has great strength combined with unusual toughness and flexibility. It is strong, safe and durable.

All of our ropes, for whatever purpose, are made from highest quality material of the grade best adapted to a particular work.

Agents in over 100 Cities.

56 years in business.

**A. Leschen & Sons Rope Co.**  
ST. LOUIS, MO.

New York Chicago Denver Salt Lake San Francisco

The world's mightiest works  
depend upon

## "Yellow Strand" Wire Rope

The Panama Canal, the marvel of engineering science; and the Woolworth Building, New York City, at this time the tallest office building in the world, each used the "Yellow Strand" Power Steel Rope manufactured by this company.



For steam shovel and dredging work.

For general contracting.

For mines, quarries and logging camps.

"YELLOW STRAND" gives universal satisfaction.

For careful work, where an accident would involve great loss, "YELLOW STRAND" goes hand in hand with liability insurance.

Our latest catalogue 84 is full of interesting argument and description.  
Mailed on request.

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Seattle, Wash.

Established 1875

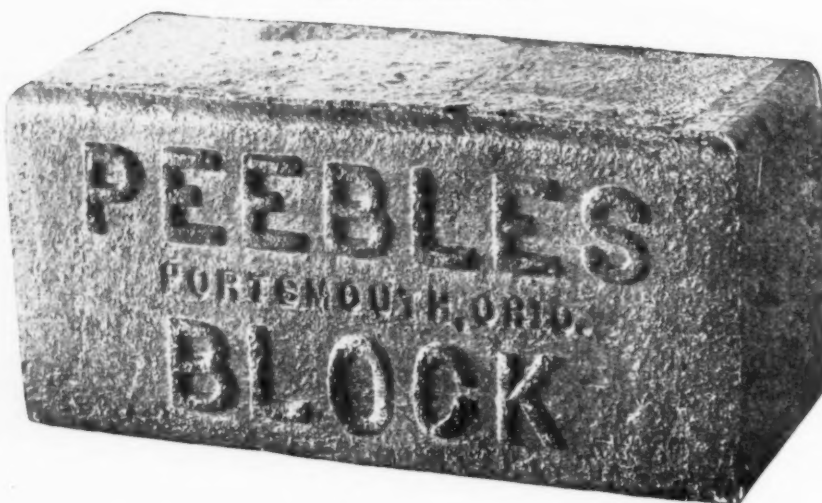
Branch Offices:  
76 Warren St., New York  
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# The Peebles Paving Brick Co.

PORTSMOUTH, OHIO

MANUFACTURERS OF

Twin Plants on  
Ohio River  
N. & W.  
C. & O.  
and  
B. & O. S. W.  
Railways



Daily  
Capacity  
100,000  
Block

LICENSED MANUFACTURERS UNDER

"DUNN PATENT"

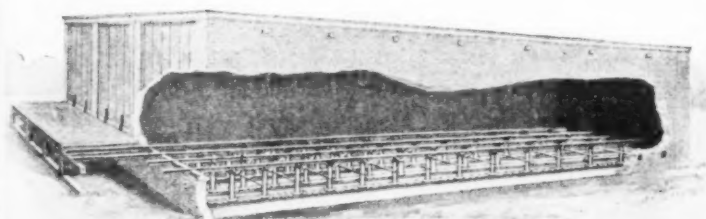
Wire—Cut—Lug—Block

We Dry Lumber Bright and Soft—Without Check-  
ing or Case-hardening

WITH

## Moore's Moist Air Dry-Kiln

34 years of practical experience in drying the  
different woods of the South.



Showing Moore's New Steel Foundation

WE GUARANTEE RESULTS  
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## L. Moore Dry Kiln Co.

Jacksonville, Fla.

## "A Southern Mill for the Southern Trade"

Guaranteed Qualities

Galvanized Sheets

Black Sheets

Galvanized and Painted Roofing

2½-inch Corrugated

2-inch Corrugated

1¼-inch Corrugated

2-V Crimped

3-V Crimped

Pressed Standing Seam

Roll Roofing

Brick Siding

Rock Faced Siding

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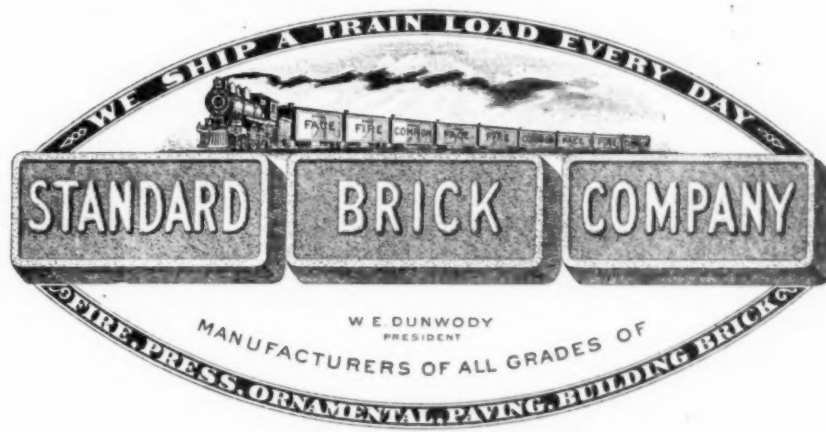
We carry an unlimited stock for immediate shipment.

## Fannin & McCullough Sheet Mill Co.

Incorporated

ASHLAND, KY.

"Pyrene"  
Fire Brick



"Cravenette"  
Face Brick

"Ratine"  
Face Brick

"Cherokee Red"  
Face Brick

Address: MACON, GA.

## "MURA-LIKE"

The ONLY permanent  
Flat Oil Paint

THE SOUTH'S GREATEST ASSET

Sole Manufacturers

## Atlantic Paint & Varnish Works

WILMINGTON, N. C.

DISTRIBUTOR IN NORTH AND SOUTH CAROLINA  
HEATH & MILLIGAN MFG. CO.'S PAINTS, VARNISHES, ETC.

"IVORY" Cement Plaster	"ATLAS" White Portland Cement	Terra-Cotta Flue Pipe and Chimney Linings
"IVORY" Wood Fibre Plaster	Pine and Cypress Shingles	SASH
Finish Plasters	"SOUTHERN CROSS" Roofing	DOORS
Plaster of Paris	"SEA GRASS" Denading Quilt	BLINDS
"SACKETT" Plaster Board	Sheathing Paper	Sash Weights
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"OLD NORTH STATE" Painted and Galvanized Tin	Mortar Colors	Window Glass
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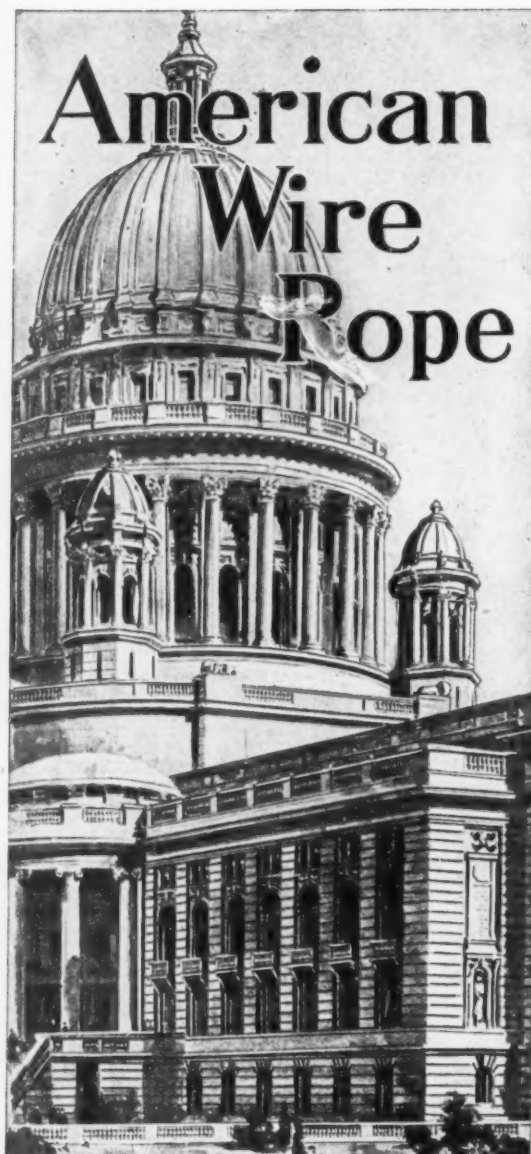
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## BUILDERS' SUPPLIES

CHARLOTTE, N. C.



# American Steel & Wire Company



New State Capitol, Madison, Wis.

Twenty-eight thousand tons of granite and twenty-three hundred tons of structural steel were used in the construction of this building.

All of this immense tonnage was handled by American Wire Rope.

Every pound of rope steel made is carefully analyzed and checked, and only such as conforms to our rigid tests ever is used for wire rope, whether of iron, crucible cast steel, extra strong crucible steel, plow steel, monitor steel or tico special steel.

Equipped with Kaestner & Hecht elevators using American Wire Rope.



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Over seven hundred thousand feet of our best grade rubber covered wire used in this building.

Every foot is carefully inspected by us in the various stages of manufacture, and when completed is finally inspected by an authorized representative of the National Board of Fire Underwriters.

We are prepared to furnish this wire in all sizes and conductors, both solid and flexible, from warehouses conveniently located for quick delivery to all parts of the country.



New Chicago & Northwestern Depot, Chicago

Three hundred and twenty thousand square feet of Triangle Mesh Concrete Reinforcement used. Triangle Mesh Concrete Reinforcement is made from Cold Drawn Steel Wire. Tensile strength 85,000 pounds per square inch. Furnished in rolls of 150, 200 and 300 feet long.

We are now furnishing large quantities of this material for reinforcing concrete highways.

"Engineer's Handbook of Concrete Reinforcement" furnished free upon request.

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Boston, 120 Franklin St.

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Pittsburgh, Frick Bldg.  
Buffalo, 337 Washington St.

Detroit, Foot of First St.  
Cincinnati, Union Trust Bldg.  
St. Louis, Third National Bank Bldg.

St. Paul-Minneapolis, Pioneer Bldg., St. Paul.  
Oklahoma City, State National Bank Bldg.  
Denver, First National Bank Bldg.  
Salt Lake City, Walker Bank Bldg.

United States Steel Products Company  
New York, 30 Church St.

## Pacific Coast Department

San Francisco, Rialto Bldg.  
Portland, Sixth and Alder Sts.

Seattle, Fourth Ave. South and Connecticut St.  
Los Angeles, Jackson and Central Aves.



HEARD NATIONAL BANK, JACKSONVILLE, FLA.  
Foundations Waterproofed With Ceresit

**"Ceresit"**  
**Waterproofing**

## CERESIT WATERPROOFING CO., CHICAGO

Main Office: 82 W. Adams St.

Branches 1133 Broadway, New York  
1218 Chestnut St., Philadelphia

Ceresit Factories are Located in Chicago; Unna, Westphalia, Germany; London; Paris; Vienna; St. Petersburg

May be used with the positive assurance that it will keep water out of all concrete work on tunnels, foundations, dams, reservoirs, swimming pools, cellars, water tanks, water towers, walls, floors and roofs. Ceresit Waterproofing is a paste, which when mixed into the gauging water renders concrete and cement mortar impermeable to water and even dampness.

Beware of imitations claimed to be just as good. Ceresit is sold in packages labeled with our name for identification.

Agents Wanted in Unoccupied Territory.

## Water Cannot Penetrate Ceresitized Concrete

Whether the concrete wall be six inches or six feet thick, it is waterproofed throughout the entire mass.

The leading engineers in America and Europe recognize in CERESIT the most effective water resistant at the lowest possible cost.

Well satisfied users of Ceresit attest to its waterproofing qualities.

### Defiance Cement Works

Defiance, Ohio, Nov. 25, 1912.

Ceresit Waterproofing Co., Chicago, Ill.

Gentlemen:—

In your last letter you asked us to give our opinion of Ceresit. The biggest job was retaining walls for the Defiance Machine Works between the office and canal. They experimented with other waterproofing, but Ceresit was the only one that proved satisfactory. We use it also for plastering "Silos," cement cisterns and numerous other jobs.

DEFIANCE CEMENT WORKS,

John Schlembach, Prop.

### PLEASE CUT OUT THIS REMINDER

to write for book "IN" on  
WATERPROOFING to

Ceresit Waterproofing Co.  
82 W. Adams St., Chicago (20)

# LABOR SAVING

The *labor* per square yard is approximately 50 *per cent.* less when

Johnston's  
**NUWAL**  
Flat Washable  
**PAINT**

is used, than when an Oil or an Oil and Varnish Paint is applied.

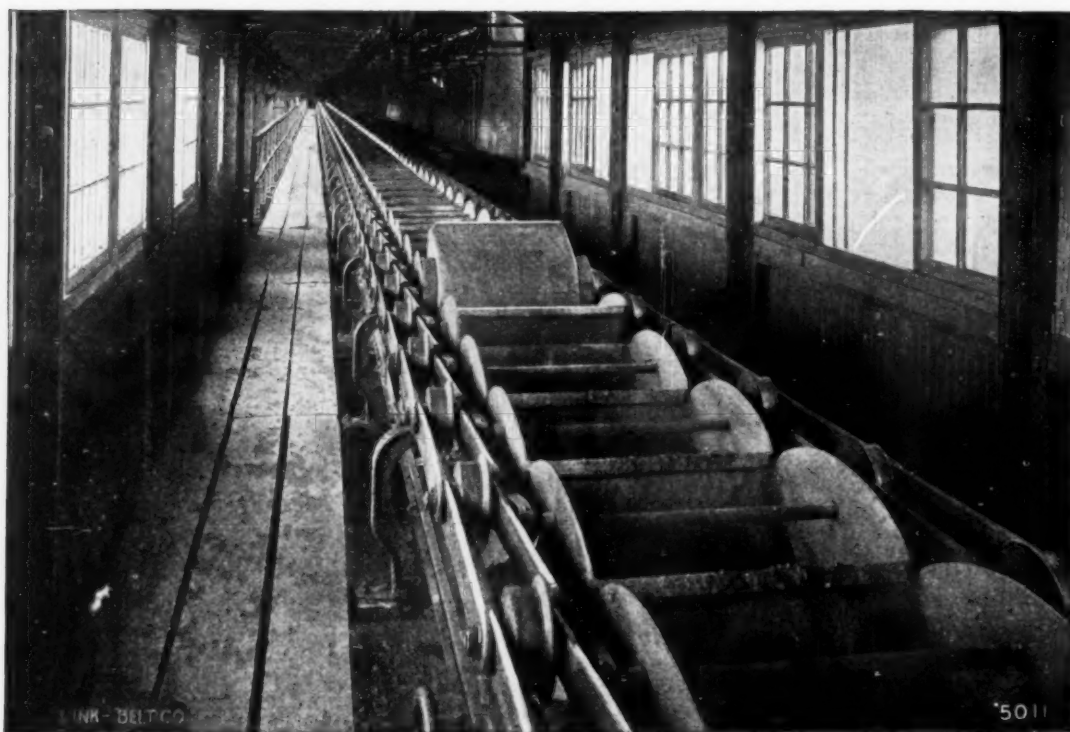
The saving in *cost of material and labor* together by using

Johnston's  
**NUWAL**  
Flat Washable  
**PAINT**

in the place of an Oil or an Oil and Varnish Paint is about 65 *per cent.*

The R. F. Johnston Paint Co., Cincinnati, Ohio





Horizontal run of Peck Carrier over coal bunkers

## Are your Coal-Handling costs too High?

Did you ever consider how much it costs to handle coal and ashes in your power house?

Do you realize, Mr. Manufacturer, that this department is very frequently overlooked, even in manufacturing establishments employing the most modern methods in other departments?

The Peck Carrier, an overlapping pivoted bucket conveyor, is in successful operation in hundreds of power houses today handling both coal and ashes. It is smooth-running, non-spilling, requires less power than any similar type on the market today, and experience shows cost of repairs to be almost negligible. *It is the recognized standard method of handling coal and ashes in the modern power plant.*

If you are interested in cutting down the cost of handling your coal and ashes, let us tell you just what the Peck Carrier will do for you. Hundreds of testimonials from satisfied customers cover almost every point that it is possible to raise—proof of its unequalled success.

The Peck Carrier is also extensively used for handling cement and hot and cold clinker in cement mills, as well as for sand, gravel, crushed rock, ore, etc.

Our new Peck Carrier Book No. 120 explains the design and construction fully, and shows its superiority over all other types. Every factory manager should have a copy.

### **We Also Design and Build**

Conveyors for Freight, Etc.  
Stone, Sand and Gravel Conveyors  
Belt Conveyors

Portable Wagon Loaders  
Portable Bag Piling Machines  
Asphalt Paving Plants

Locomotive Cranes  
Sugar Handling Machinery  
Tipple Equipments for Coal Mines

Write for set of Link-Belt Catalogs—address nearest office.

## **LINK-BELT COMPANY**

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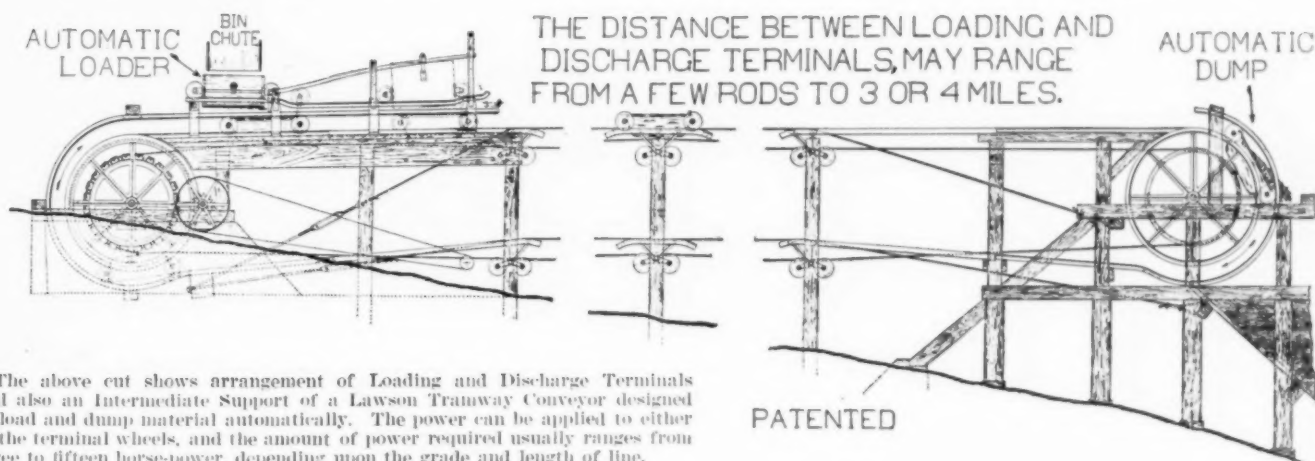
New York.....299 Broadway  
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St. Louis.....Central Nat'l Bank Bldg.

Seattle.....512½ First Ave. S.  
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Birmingham.....General Machinery Co.

# Lawson's Tramway Conveyors

The Cheapest and Most Efficient Method for

Transporting Lumber, Cross-ties, Coal, Ore, Sand, Clay, Etc.



The above cut shows arrangement of Loading and Discharge Terminals and also an Intermediate Support of a Lawson Tramway Conveyor designed to load and dump material automatically. The power can be applied to either of the terminal wheels, and the amount of power required usually ranges from three to fifteen horse-power, depending upon the grade and length of line.

Tramway Conveyors of this type, having a capacity of fifty to five hundred tons of material per day, can be constructed over any character of country, no matter how steep or rugged, and for any distance ranging from a few rods up to three or four miles, at a cost of forty to ninety cents per foot, exclusive of terminals and car or carrier equipment.



Views taken of lines recently constructed near Plattville, Wis.

It will be noted that the tracks are arranged one directly above the other—the upper track being for the loaded cars, while the lower track is for the empties. The cars are clamped securely to an endless hauling cable, motion to which is imparted by the rotation of the power terminal wheel, on which are mounted a series of clutches which prevents the cable from slipping. As the loaded cars are carried down and around the discharge terminal wheel, the material is dumped automatically and the empty cars are then returned in an inverted position to the loading terminal wheel and are carried up and over same to a position directly beneath the bin-chute, where they are loaded by the Automatic Loader. In transporting lumber, cross-ties, etc., the material is placed on the cars, or carriers, while in motion and simply drops off endwise as the cars or carriers go over the discharge terminal wheel. This is the simplest and most efficient type of Tramway Conveyor ever devised, as there are no clutches to give trouble by slipping or becoming disengaged from the hauling cable, nor is there any labor required in unloading the material or in transporting the cars from one track to the other.

We also build Conveyors for use around industrial plants for handling Ashes, or other refuse matter, Brick, Lime, Cement, Grain, Boxes, and in fact any and every kind of material. Let us know your requirements and we will quote you on a Conveyor adapted to them, complete and ready for operation.

We also build and operate Conveyors at our own expense and contract to move any kind or quantity of material at an agreed price per ton. Simply let us know the kind and quantity of tonnage you have to move, the time within which you wish it done, and send us a sketch showing distance between loading and unloading points, the character of the intervening country, locating all highways, streams or other obstructions, and we will advise as to what our charges would be for the work.

Our many years of experience with all kinds of problems in short-distance transportation, and in the handling of all classes of material, is at your service. Write us—

**CONSOLIDATED TRAMWAY COMPANY**

ROANOKE, VA.



# BLACKMER & POST PIPE CO.



Sanitary

Economical

Permanent

Stood Highest "Knife-Edge" Test at Only Municipal Sewer Pipe Testing Plant in Country—Brooklyn, N. Y. Send for Copy.



Convenient in Construction

Smoothly Glazed Surface

No Soil Pollution

No Disintegration

## Vitrified Sewer Pipe



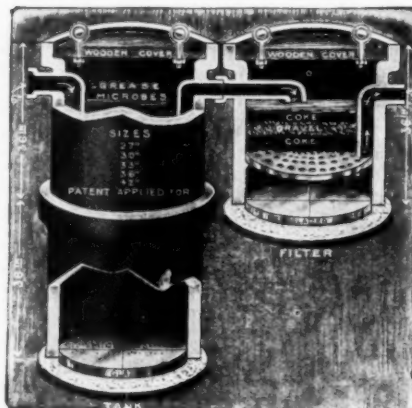
ACID PROOF

Large Sizes  
27, 28, 30, 33, 36,  
39 and 42 Inch

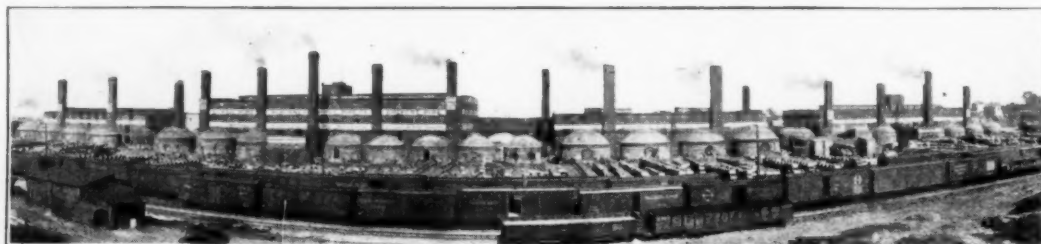
A SPECIALTY

A Permanent Material for Permanent Work

Septic Tanks for Private Houses



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PHOTOGRAPH OF OUR WORKS AND CAR LOADING FACILITIES

# BLACKMER & POST PIPE CO.

ST. LOUIS, U. S. A.

Send for Catalogue and Prices.



## National Lock Joint Cast Iron Culvert Pipe

Like Brother and Sister are Inseparable

To the Man With Culvert Experience the Points of Lock Joint Pipe Will Appeal Strongly

Made of cast iron—the most permanent rust-resisting commercial metal known. Sold by the lineal foot, not the ton. Made in 3, 4 and 5 foot lengths. These short lengths make it light in weight for handling, yet render great *strength* on account of the reinforcing given by the extra bells. These short lengths mean that your culvert generally comes out flush with the bank—no expense for headwalls.

The Lock Joint is made by simply *turning* the pipe. The locks on bell and spigot engage and are *inseparable*. Fully locked—the pipe is rigid. Partly locked—flexibility to meet any road crown or bend is achieved. This pipe, owing to its short lengths and special joints, can be installed with *no tools*, in sizes up to 48" in diameter. Above that, 4 men, a chain, pole and jack. Used by over 40 trunk lines and other roads.

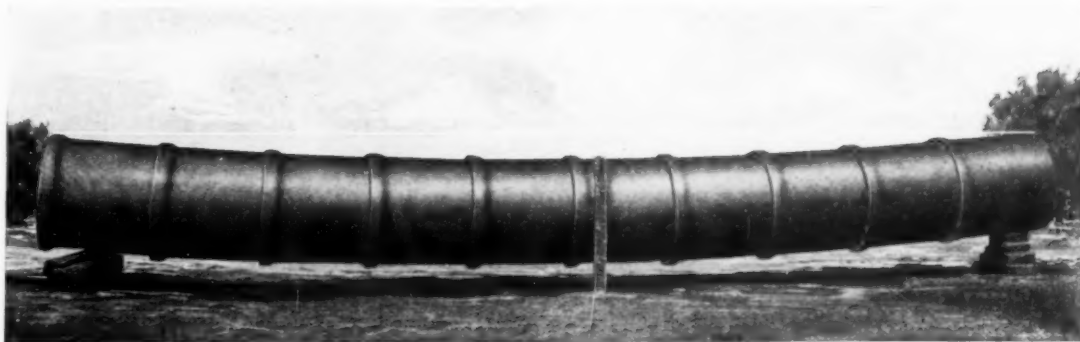
## American Casting Co.

BIRMINGHAM, ALABAMA, U. S. A.



A 30 ft. run of 36" National Pipe with joints locked up tight. Note the lack of any sag.

A 30 ft. run of 36" National Pipe with joints partly locked. Note the sag. If laid as a crown this line could settle as much below horizontal as crowned above before a strain would be thrown on the joints. The locks would then prevent separation.





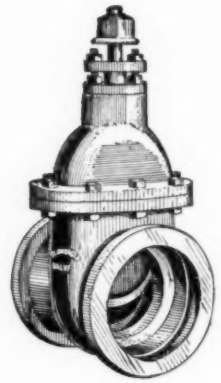
# Glamorgan Pipe & Foundry Company

LYNCHBURG, VA.



MANUFACTURERS OF

Cast Iron Water and Gas Pipe, Special  
Castings, Flanged Pipe and  
Flanged Fittings



Gate and Compression Hydrants, Water, Gas and Steam Valves

General Founders and Machinists

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MACON, GEORGIA

Manufacturers of  
Salt Glazed Vitrified Sewer Pipe  
Fire Clay, Flue Linings  
Stove Pipe  
Wall Coping

We make prompt shipments

*Inquiries Solicited*

## H. Stevens' Sons Co.

MACON, GA.

MANUFACTURERS  
Sewer and Railroad  
Culvert Pipe

Fire Brick, Wall Coping  
Flue Lining, and other  
Clay Products

OLDEST SEWER PIPE FACTORY  
IN THE SOUTH



## RAND POWDER CO. OF TENN.

### Mining and Blasting Powder

Dynamite and Blasting Supplies

702-703-704 Bank and Trust Building

KNOXVILLE, TENN.



## The Unit Road Machine

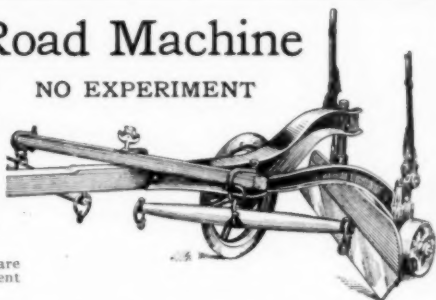
FULLY TESTED NO EXPERIMENT

Over 1000 in Successful Operation between Virginia and the Gulf.

Only One Man and One Team required to operate it.

The Price is Less than One-Fifth, the Expense of Operating but a Fraction of that of the large graders.

Used Where the Heavy Machines are Impracticable and does as efficient work.

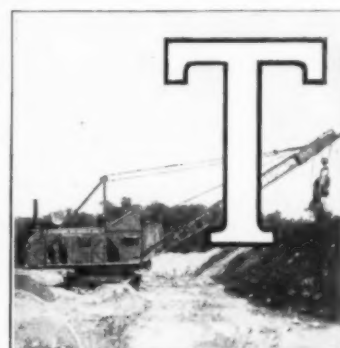


### Pays for Itself in Few Days' Use

Write for booklet and terms on which we send the UNIT on trial

**The Call-Watt Co., Richmond, Va.**

MANUFACTURERS, BOX 602



## THE Bucyrus Dragline EXCAVATOR

Will do work no other Excavator can do.

The Caterpillar Traction enables it to walk from job to job with ease.

Figure for yourself the saving on reclamation work.

STEAM, ELECTRIC, OIL AND GASOLINE DRIVEN

Mounted on Skids and Rollers, Trucks and Caterpillar Traction.

We also build Steam, Electric and Oil Shovels of all sizes, Dredges, Unloading Plows, Railway Wrecking Cranes and Loco. Pile Drivers.

Built with Booms 40 to 115 feet long and Buckets 1 to 3 cu. yds.

**BUCYRUS COMPANY, So. Milwaukee, Wisc.**

New York Chicago Birmingham Duluth

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## American Cast Iron Pipe Co.

Manufacturers of



Birmingham

Alabama

SALES OFFICES:

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No. 1 Broadway, New York City

416 Praetorian Building, Dallas, Texas

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## Logging Machines



OUR Customers all say this is the greatest Logging Machine ever thought of for getting logs at the minimum cost per thousand. Some of them say it saves them \$1.50 per thousand feet. It saves others a great deal more than \$1.50 per thousand. Everyone of the most successful Lumber Companies in the North Carolina Pine Belt uses my Machines.

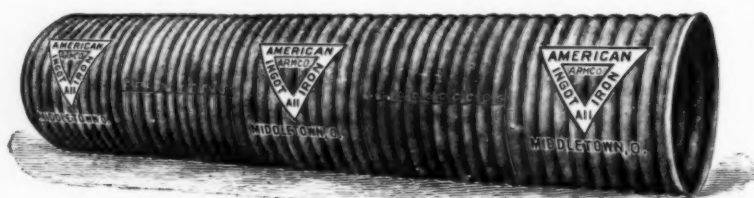
No company who has used my Machine has failed to make money.

We think these facts speak very plainly.

For full particulars and catalog, write to

**SURRY PARKER, - PINE TOWN, N. C.**





8 to 8' Diameter

## MANY DOLLARS ARE YOURS IF YOU CARE FOR THEM

**W**E are pioneer manufacturers in the South of Corrugated Culverts, Tanks and Metal Houses. Our enviable reputation is built on a "Pure Iron" basis—first-class workmanship and reliability. GENUINE AMERICAN INGOT IRON, RUST RESISTING SHEETS, are used and recommended in all our AMERICAN CORRUGATED CULVERTS and TANKS because of its unusual resistance to corrosion and greater durability—costs a trifle more, but saves many dollars in the end; We furnish proof. We are Southern distributors for all American Ingot Iron products. Write and permit us to tell you more. We make Tanks and All Iron Garages too



### The Dixie Culvert and Metal Co.

Factory: Atlanta, Ga.

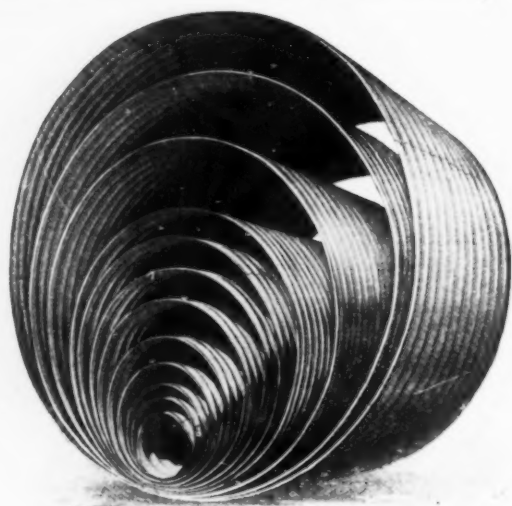
Greensboro, N. C.

Little Rock, Ark.

New Orleans, La.

Jacksonville, Fla.

Shawnee, Oklahoma



## CORRUGATED CULVERT

in all sizes  
from 8" to 84"

The only question about culvert today is one of material. As compared with other materials, the corrugated culvert we make from genuine American "Ingot" iron is far superior. It is so strong that the heaviest traffic has no effect on it; it cannot rust because it is made from iron that is 99.94 per cent. pure. Some culvert materials rot while others rust; both must be replaced in time—usually in a relatively short time. But the culvert we make is a permanent installation, as is proved by their long and satisfactory use by railroads and road makers.

This is demonstrated fact; we can convince culvert users by our book showing results of tests and containing testimonial letters. Write for book on "Culverts"—handsomely illustrated—and for our catalogue.

Kentucky Culvert Mfg. Co., Inc.  
Buechel, Ky.



## "ALLWORK" 30 Tractor

KEROSENE OR GASOLINE  
4-CYLINDER VERTICAL ENGINE  
30 H. P. AT THE BELT  
20 H. P. AT THE DRAW BAR  
3 SPEEDS FORWARD, ONE REVERSE  
HEAVY AUTOMOBILE TYPE STEERING KNUCKLES  
8500 LBS. LIGHT WEIGHT, HIGH POWER  
STEEL CONSTRUCTION, ENCLOSED GEARS



Pulling 21,000 Lbs. Axles Up a 15% Grade

Our "ALLWORK" 30 TRACTOR is just the machine lumbermen have been looking for to use in their yards. Its steering arrangement permits of short turns and easy control. It can go where a horse can, is simply constructed, does not require an expert to operate it.

Our "ALLWORK" 30 eliminates the use of horses and saves money, does the work more quickly and satisfactorily. Expense stops when not in use.

TWO LARGER SIZES FOR LOGGING

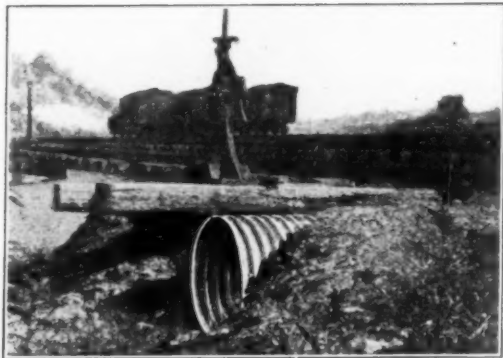
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**ELECTRIC WHEEL CO., Manufacturers**

Box 89-T

QUINCY, ILL.

## WHAT BETTER EVIDENCE IS WANTED



Used by the leading railroads of the country.  
No more conclusive endorsement is required for  
our "AMERICAN INGOT IRON" Corrugated  
Culverts as to strength and durability.

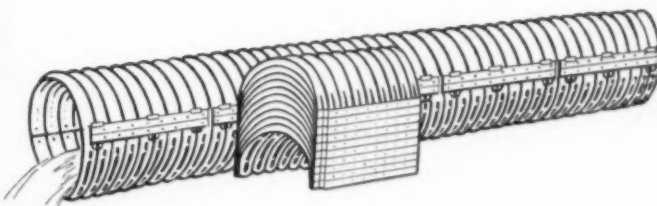
SEND FOR OUR LATEST CATALOGUE

**Virginia Metal and Culvert Co.**

Main Offices

ROANOKE, VA.

## "Butt-Joint Nestable" Corrugated Metal Culverts



KEY-LOCKED JOINT—NO HOLE IN METAL

NO RIVETS—NO BOLTS

This perfect construction of a culvert has been a long time coming, and the honor finally fell to the South.

Southern Brains invented it!

Southern energy and money developed it!

Southern honesty has put 100 per cent. value into every foot of it!

Those who have used our culverts know these things, and it is our desire that all should know it.

Our factories are open to the world, and we invite all prospective users to see for themselves.

It is time for the South to quit sending Thousands of Dollars to the North for drainage pipe. Keep your money at home where it will do good. Our factories are the only culvert factories that are owned and run exclusively by Southern men. We do not have to short-gauge you and put faulty metal into your culverts to make up for excessive freight rates. We put the value into our culverts and you pay for only what you get.

Our culverts are so perfectly constructed that a child can put them together, and needs nothing but the two hands given it by nature and a pair of nippers to do it.

We make nothing but culverts, and direct all of our energy in making the best culvert in the world. Their merit has been proven by the fact that we are, today, the largest manufacturers of culverts in the South. Send for our price-list and you will find that we have an honest price as well as an honest culvert.

The iron that we use in these culverts is made from pure iron ingots, and we guarantee that it will analyze 99.90 or better in purity.

Our brand is stamped on the culvert.



**Birmingham Metal Products  
Co.**

MAIN OFFICE

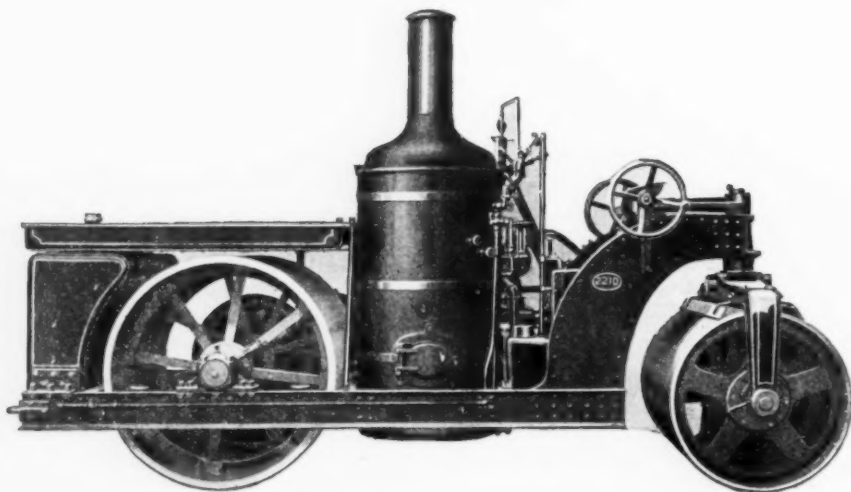
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Factories established and being established at convenient points throughout  
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KELLY-SPRINGFIELD TANDEM STEAM ROLLER

STEAM AND GASOLINE  
ROAD AND STREET ROLLERS

UNIVERSALLY USED FOR  
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ALL SIZES AND STYLES  
FOR ALL  
REGULAR AND SPECIAL REQUIREMENTS

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"Our Rollers are Built for Life-time Service"—We Have Proven It

FOR THIRTY YEARS

## KELLY-SPRINGFIELD STEAM AND GASOLINE ROLLERS

Have Been Unequaled for Economical and Reliable Service

THE CITY OF NEW YORK  
DEPARTMENT OF PARKS  
The Arsenal, Central Park, 64th Street and Fifth  
Avenue

NEW YORK, Jan. 4, 1912.

THE KELLY-SPRINGFIELD ROAD ROLLER CO.

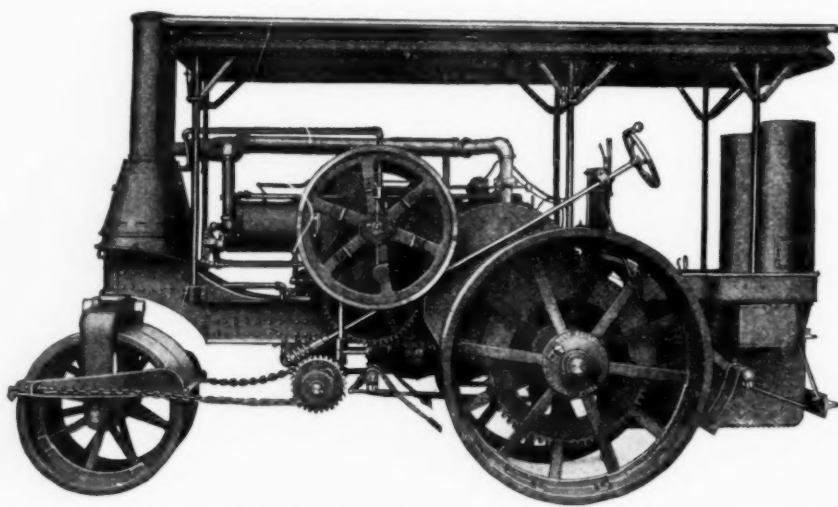
SIRS:—You are hereby notified that the proposed  
sureties offered by you on proposal for TWO GASO-  
LINE MOTOR ROAD ROLLERS for Parks in Man-  
hattan have been approved by the Comptroller as ade-  
quate and sufficient, and the contract has been awarded  
to you, and you are required to execute same at this  
office within five days after receipt of this notice.

In case of neglect so to execute said contract, the  
amount of deposit made by you will be forfeited to and  
retained by the City as liquidated damages for such  
neglect.

Respectfully,

(Signed)

CLINTON H. SMITH,  
Secretary Park Board.



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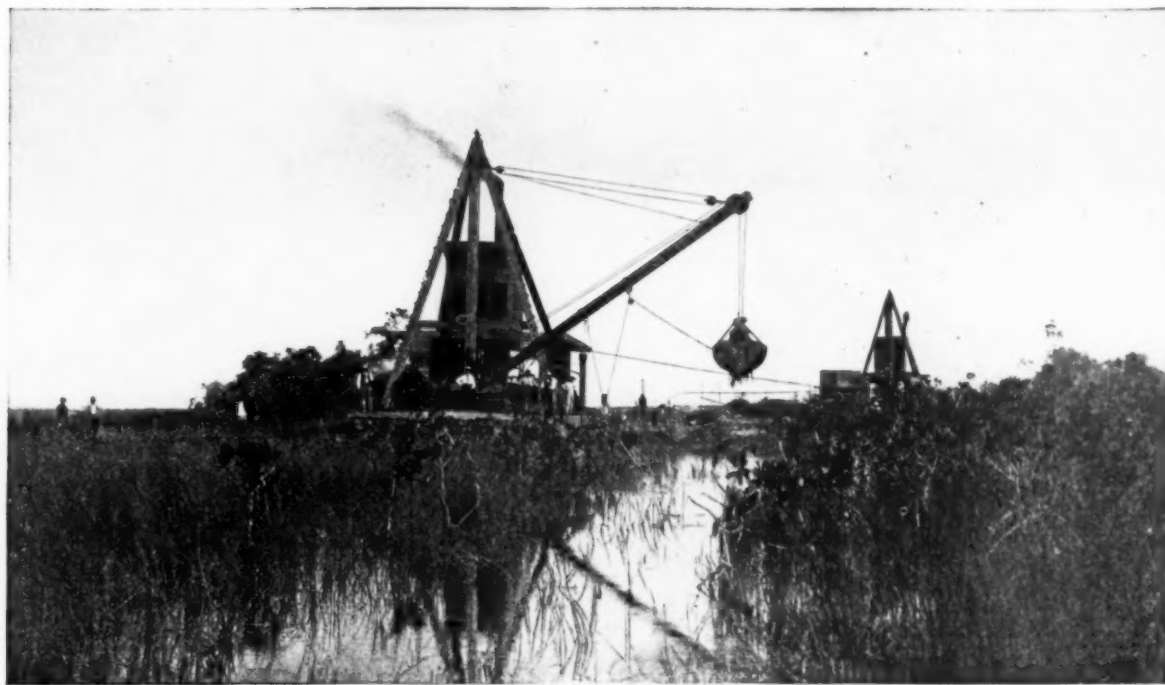
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Our Engineering Department will be pleased to advise you, if you so desire, in regard to Hayward equipment best adapted for your work



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Should demand a safe minimum of  
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Harris Granite Quarries Co.  
SALISBURY, N. C.

Established Seventeen Hundred Ninety-One



One Hundred and Twenty-Third Year

UNDER THE MANAGEMENT OF  
**J. E. CONANT & CO., (Auctioneers)**  
 OF LOWELL, MASSACHUSETTS

THE business of systematic preparation for absolute auction sales and the thorough and effective advertisement of such sales has become of as much importance in the successful liquidation of large manufacturing properties as has the clearing house system to the national banks.

The danger is more apparent than ever before of leaving the management of the sale of large manufacturing or other properties to the amateur, the layman, or the inexperienced.

For one office to prepare and make the catalogue of a property for sale, for another office to advertise the sale, and for a third office to sell the property means disaster from the start.

The following absolutely necessary for complete success in any sale must, in addition to the dealer and speculator, comprise the actual user, the actual consumer, and the purchaser who buys because of home demand.

A well grounded knowledge of and much familiarity with the property in hand is positively essential to the intelligent handling of the same for sale.

The sale value of many properties is depreciated by indecision as to what to do, dilatory and waiting methods. The time to sell any property is immediately and at once it is for sale, from that moment it commences to grow common and become stale.

Combinations not endured.

Within the last ten or twelve years the management of the sale of some two hundred manufacturing properties situated in seventeen different states of the country has come to hand unsolicited—an experience without precedent.

How a property should be divided, in what order it should be sold, in what manner presented to the public, and who should be notified, are not matters of opinion but purely those of experience.

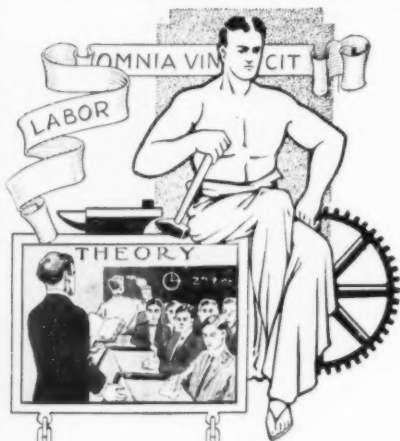
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# THE ALABAMA SCHOOL OF TRADES AND INDUSTRIES

RAGLAND, ALA.

## To Train Southern White Boys for Their Mighty Task



In the South we have the cotton, the lumber, the phosphate rock, the marble, the cement, the coal, the iron, the oil, the lead, the zinc. Of what avail are these natural resources if we must leave them to others to be developed? Much of our power is in oil, coal or water. Much more of it is in our white boys.

With the vast natural resources of the South there is great need of a technical education for our boys. As an example of the great possibilities for wealth and development we cite just one incident in regard to pig iron:

### RAW MATERIAL versus BRAINS

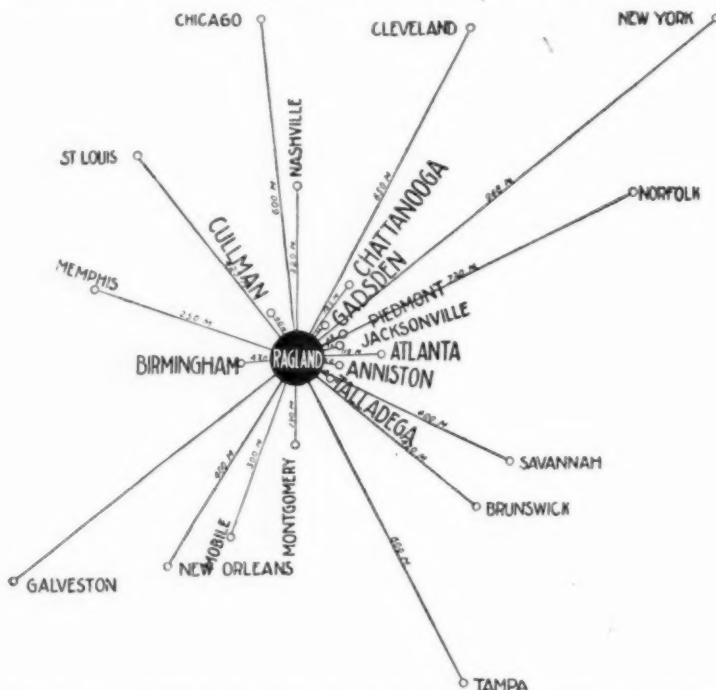
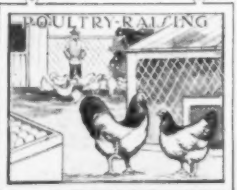
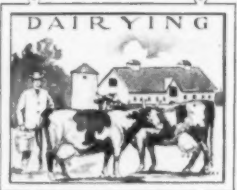
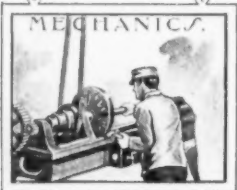
Pig iron is worth, say, \$20.00 per ton:

Made into horse shoes it is worth .....	\$ 90.00
Made into knife blades it is worth .....	200.00
Made into watch springs it is worth .....	1000.00

That is:

Raw iron..... \$20.00      Brain power..... \$980.00

This is true also as applied to agricultural training, as has lately been shown in the increased production of corn, cotton, hay and vegetables to the acre, at less cost.



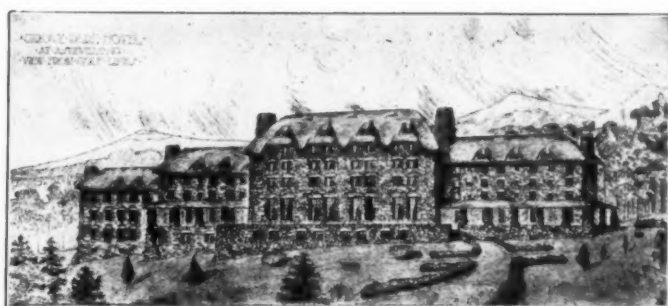
This school has been established at Ragland, in the center of the great industrial and agricultural district of Alabama, to teach and train boys in all vocations and callings of life who are not qualified and financially able to attend higher institutions of learning, and thus afford an opportunity to enter higher institutions.

It is intended that this School shall be  
one of the Greatest Schools in the South

The State of Alabama has appropriated \$30,000 for buildings and equipments, \$5,000 annually toward its maintenance, and \$25,000 when an equal amount has been raised from other sources. When this amount or more has been raised, 1000 acres of adjoining land will be donated. The trustees expect to secure donations from men and women who have the good of such a school at heart and from other philanthropic sources. It is also expected that the railroads and other large and small corporations will donate liberally to the industrial shops in connection with the school. We already have one hundred acres of land beautifully located, and the trustees are ready to begin the erection of the school buildings and dormitories as soon as sufficient funds are in hand to justify, which is expected at an early date. For detailed information, address

WATT T. BROWN, Chairman Board of Trustees  
RAGLAND, ALABAMA

## The Finest Resort Hotel in the World Is Being Built at Asheville, North Carolina



**M**R. E. W. GROVE, of St. Louis, Mo., is building the finest resort hotel in the world, to be opened July 1st, 1913. It will be absolutely fireproof, and is being built of the great boulders of Sunset Mountain, at whose foot it sits. It is being built by hand in the old-fashioned way. Full of rest and comfort and wholesomeness.

The front lawn is the hundred-acre eighteen-hole golf links of the Asheville Country Club, and with it sixty acres of our own lawn.

The purest water obtainable anywhere, piped seventeen miles, from the slopes of Mount Mitchell, over 6000 feet altitude. Biltmore milk and cream exclusively, supplied from 200 registered Jerseys on the estate of Mr. Geo. W. Vanderbilt. It is doubtful if this famous dairy is equaled in the world.

Four hundred one-piece rugs are being made at Aubusson, France. Seven hundred pieces of the furniture are being made by hand by the Roycrofters. The silver will be hand-hammered.

The plumbing material will be the finest that has ever been placed in any hotel in the world. The soil pipe has been hydraulically tested and then galvanized. The hot water pipe, 18,000 lbs. in weight, will be solid brass. The steam pipes are Byers' genuine lap-welded wrought iron tested hydraulically to 1000 lbs. The bathtubs and fixtures all solid porcelain. No pipes visible anywhere. No radiators to be seen—all placed in recesses under windows. No electric bulbs to be seen.

The "Big Room," or what some call the lobby, is 80 feet by 120, and the rugs in this one room will be worth \$5000.00. The two great fireplaces in it will burn twelve-foot logs.

For the golfers we are building lockers and shower bath rooms with a forty-foot swimming pool that will not be excelled by the finest clubs in existence, and the players will be less than 100 yards distant when they are on the links.

Mr. Wm. S. Kenney, of Bretton Woods, N.H., who has shown in his management of The Mount Washington Hotel and Hotel Clarendon that he is the peer of hotel keepers, will manage the Inn.

We own eight hundred acres around the Inn (consumptives not taken), and are glad to be able to offer the finest combination of climate, of comfort and of happiness in surroundings that we believe has ever been made possible.

Especially available for Northern guests in Spring, Fall and Winter, going or returning from farther southern resorts, or for an all Winter resort.

The Inn is located on the side of Sunset Mountain, about a mile from the top, and is not only cool enough in the Summer to make a blanket necessary at night, but is protected and mild enough in the Winter to make life enjoyable without enervation.

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SUNSET MOUNTAIN, ASHEVILLE, N. C.



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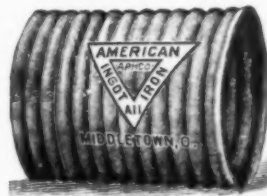
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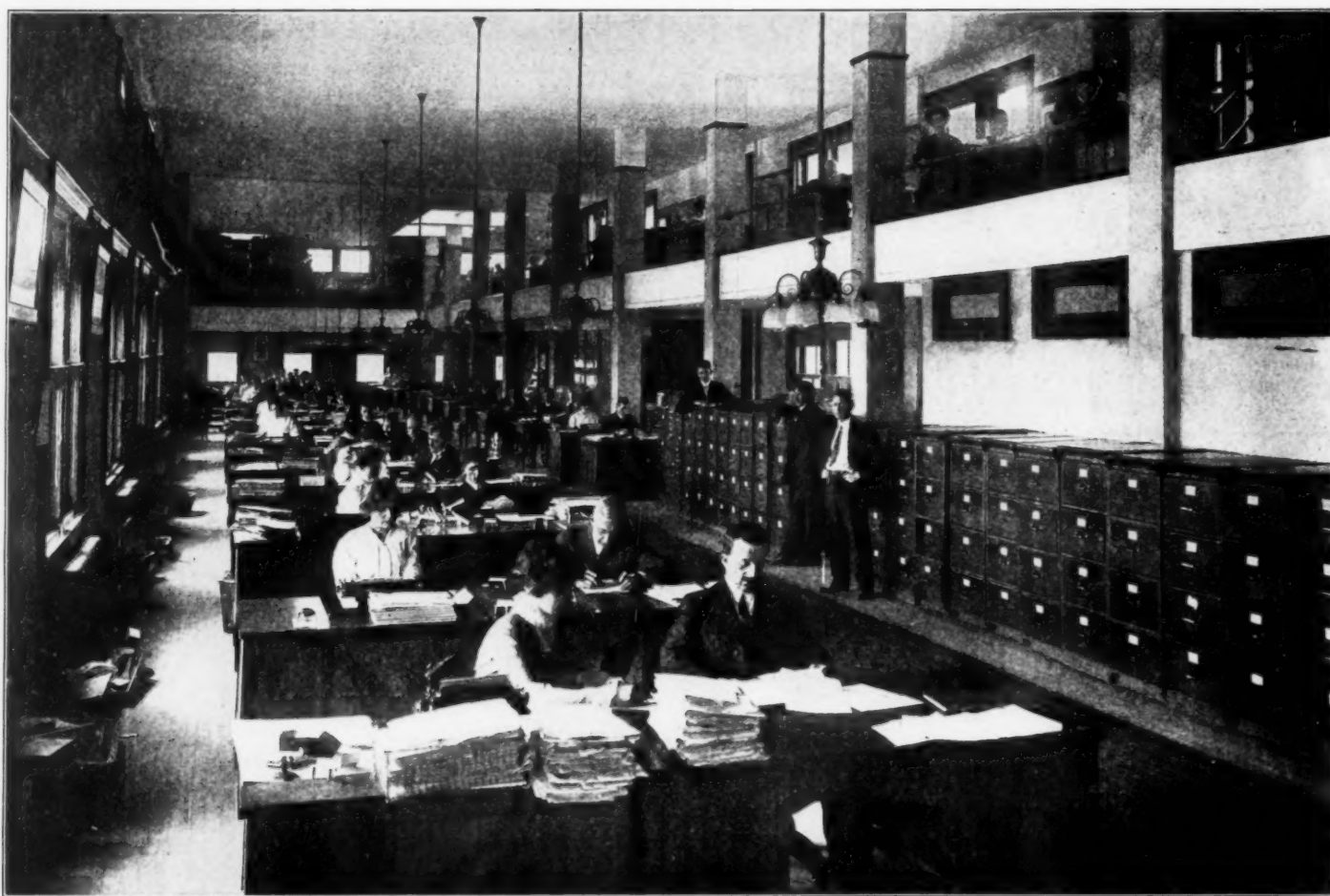
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Potts, John G., rain makers.  
McKay, George, machine for forming drop-proof covering for walls and ceilings.  
Tucker, J. L., flying machine.  
Schleier, Charles W., safety envelopes.  
Bjorklund, Hilding A., vehicle wheels.  
Blake, Larkin S., lamp burners.  
Burgess, Robert M., spring wheels.  
Kirkendall, Euit A., releasing device.  
Hutchins, Albert, and McFarland, Edward H., street sweepers.  
Karnes, Allen A., magazine pipes.  
King, Robert E., collar buttons.  
Harrison, John Andrew, lubricators.  
Kade, Charles F., drawers or bins.  
Deprator, Edward, rails.  
Buck, Chester H., trolley heads.  
Fritzsche, Otto, shoe protectors.  
Everett, Percy, race track.  
Fellbach, Arthur O., spring forks and motorcycles.  
Anderson, Joseph H., excelsior machine.  
Ley, George A., photographic printing apparatus.  
Jones, George W., window-glass fastener.  
Livingood, George B., fruit strainer.  
Langton, Charles S., mowing machine.  
Ludwig, Christopher A., batpin.  
Wren, Julian Thomas, gate latch.  
Waterworth, Charles E., umbrella.  
Nicholas, Francis C., separator.

Parrish, John M., fire escape.  
Shira, William H., street sweeping machine.  
Steel, Leonard R., glass-lined milk can.  
Rauch, Charles, internal combustion engine.  
Moody, John B., table for steamship.  
Moon, Arch, cushion wheel.  
Loesser, Edward J., non-refillable bottle.  
Young, Marvin S., account book.  
Tucker, Arthur R., stair squares.  
Zadora, Joseph, nose bag.  
Steinke, Gustave, wrenches.  
Turnbull, Percy, containers.  
Moore, Charles, car fender.  
Ellis, Preston A., vehicle bodies.  
Shipman, Francis T., barrow carts.  
Larkin, Walter, mail box holder.  
Kurtz, Barton S., trace hook.  
Stocker, Anthony, table holder.  
Smith, Frank W., horseshoes.  
Sachse, Arthur, storage plants for explosive liquids.  
Scott, John Winfield, non-refillable bottle.  
Phillips, Charles H., headlight controlling device.  
Blake, Frank R., electric spark plug.  
Doyle, Thomas, safety supply boxes and powder magazine.  
Barrington, Fred G., fire escape.  
Barager, Percy D., fuse pullers.  
Anderson, Edward S., automatic weighing mechanism.

Gosch, Johannes, trolley.  
Hager, Robert, Sr., light.  
Julier, Camilla, car fender.  
Durette, Grace N., lavatory cabinet.  
Emery, George H., curtain hanger.  
Krimmel, Ned Gensemer, movable head-light supports.  
Kibbee, George Grant, electro-magnetic track brake for railway cars.  
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DeCoster, Jules M., and Bathe, Nathaniel, fruit picker.  
Buckley, John M., fire starter.  
Brooks, Samuel A., cooking utensils.  
Hendren, Walter S., toy.  
Jewell, Thomas C., bow facing oars.  
Jacobs, Leonard H., trace fastener.  
Hughes, Russel M., liquid measuring and dispensing apparatus.  
Dietz, John F., shingle.  
Snider, C. H., lamp attachment.  
Post, John L., attachment for instrument.  
Kramer, R. A., thread cutter.  
Krueger, August, gaff hook.  
Appleby, Miss C., hat hanger.  
Schoonover, Chas. O., outlet connection for sinks.  
Sieg, Ed L., flying machines.  
Estes, Barton, auto, engine guard.  
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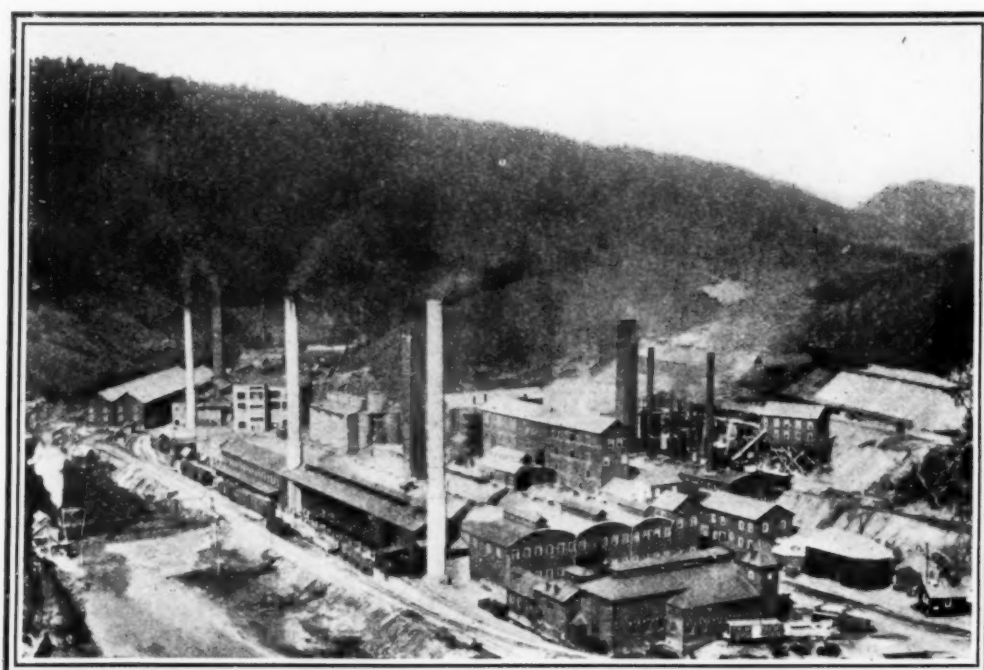
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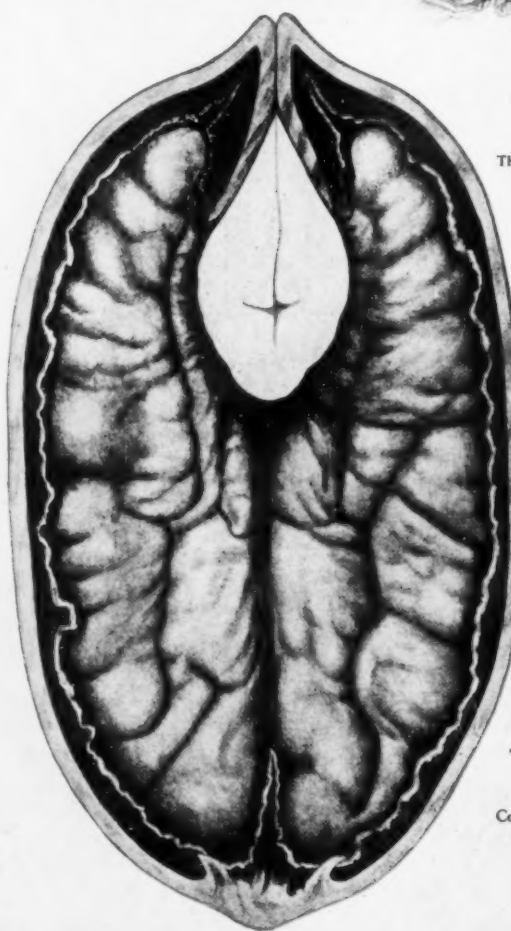
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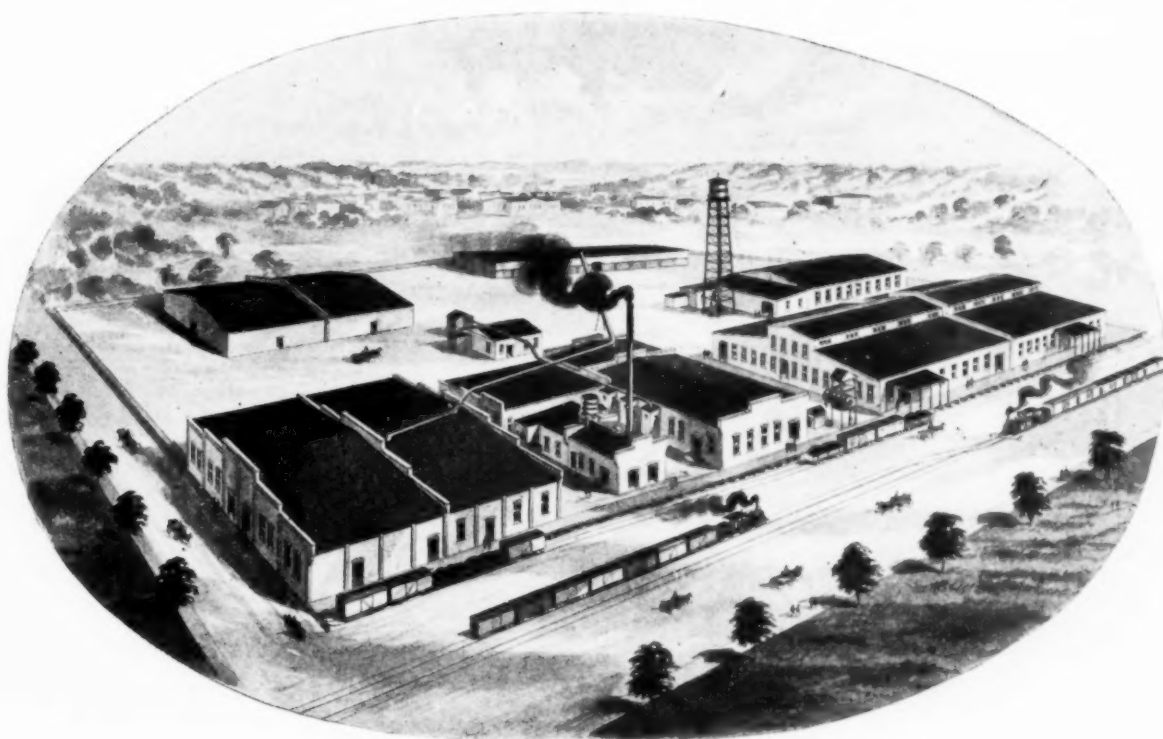
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*N. B.—We also make a specialty of compiling and publishing business-bringing prospectuses and catalogs.*

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Many Forms Stock, Bank and Corporation Books. Stationery, Stock Certificates and Bonds Lithographed. Largest and Best Ruling and Bindery Department in the South. Rubber Stamps and Seals a Specialty. Special Leaves for Every Office and Accounting Use. Blank Books Promptly Made to Special Order. Finest Quality Economical and Efficient Production Guaranteed.

"NO ORDER IS TOO SMALL FOR OUR ATTENTION. NONE TOO LARGE FOR OUR CAPACITY."

Established 1872.

Newly Equipped 1912.

Most Modern and Complete Plant in the South.

**ROBERTS & SON**

ROBERT W. EWING, - - President

3rd Ave. between 18th and 19th Sts.

**BIRMINGHAM, ALA.**



GIVES

FULL VALUE TO  
EVERY LABORING  
MAN THAT COMES  
INTO THE SOUTH

**Overalls**

**TENNESSEE OVERALL CO.**

TULLAHOMA, TENN.

## Ruse & Company

808-10-12 Low St., Baltimore, Md.

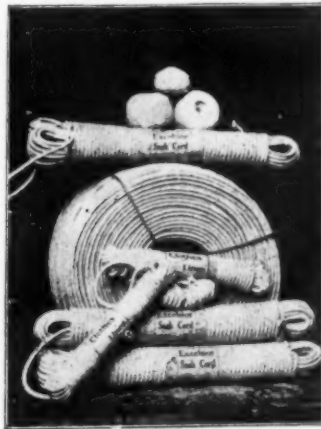
Designers and Manufacturers of  
Store and Bank Fixtures, Office  
Partitions, Railings and Tables,  
—SHOW CASES—

Designs and Estimates Cheerfully Furnished

ESTABLISHED 1896

MANUFACTURERS OF

## Braided Sash Cord



RAILROAD  
SIGNAL,  
BELL CORD

and

WATERPROOF  
TROLLEY CORD

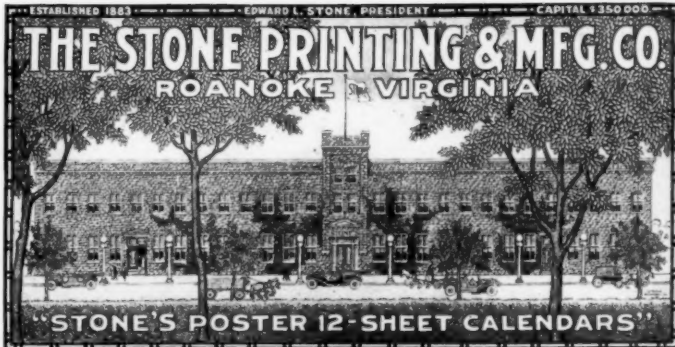
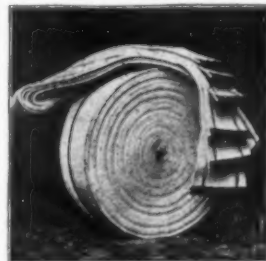
WE MAKE THE BEST  
and  
PLEASE THE TRADE

We are the Largest Manufacturers of Back Bands and  
Back Band Webbing.

**Mallison Braided  
Cord Company**

ATHENS,  
GEORGIA

Our prices will interest you.



ESTABLISHED 1883 — EDWARD L. STONE, PRESIDENT — CAPITAL \$350,000

**THE STONE PRINTING & MFG. CO.**  
ROANOKE, VIRGINIA

STONE'S POSTER 12-SHEET CALENDARS

1st MONTH—31 DAYS

**JANUARY—1913**

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Do your work with a whole heart  
and you will succeed—there  
is so little competition  
This is our  
Motto

**KEEP THIS  
IN YOUR HEAD**

THERE IS ONE SALESMAN I CAN  
NEVER FORGET!

It does a lot more than the most active,  
persistent human salesman who ever  
called on me. Often I'm too busy to  
listen to sales talk—frequently the  
salesman isn't around when I'm ready  
to buy—but THIS Calendar is always  
on the job.

It stares down at me day after  
day—twelve months in the  
year—a constant, forceful,  
effective reminder of the firm  
that sent it to me.

Small chance that I'll forget that  
firm when I want what they sell—in't  
there? And this Calendar keeps suggest-  
ing that I do need the goods it is selling—even  
when I haven't thought of it.

I can see its figures all the way across the room—and I can read its business message  
that far, too—it is continually repeating itself to me—so strongly, in fact, that I'm going to send out next year—

**STONE'S POSTER 12-SHEET CALENDARS**

Why Don't YOU Use these Efficient and Economical Silent Salesmen?

They get thousands of dollars' worth of business for the largest Manufacturers, Jobbers, Banks, Real Estate and Insurance Companies. Simply let us send you SAMPLE CALENDAR SHEETS and information that will be both profitable and interesting to YOU. Just send a brief request on your letterhead NOW

**THE STONE PRINTING AND MANUFACTURING COMPANY**  
Calendar Department — ROANOKE, VIRGINIA



# WIRE SIGNS

AN AD THAT LASTS A LIFE TIME  
THE FIRST COST IS THE ONLY COST

## THE FRED. J. MEYERS MFG. CO.

HAMILTON, OHIO

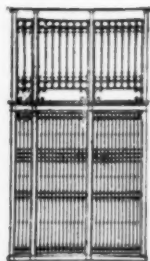


MANUFACTURERS OF  
**ORNAMENTAL  
STREET  
LIGHTING  
POSTS**

Public lighting is a thing of so conspicuous and evident a nature that there is no escaping the benefits of same. Civic pride demands this improvement.

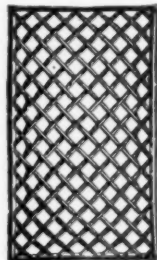
As an advertisement there is nothing better. Improve your property and your city by using our Ornamental Posts for street lighting.

Let us quote you prices.



**Elevator Cars and Enclosures**

Bank Railings  
Wickets  
Gates and Grilles  
Window Guards  
Stable Fittings  
Stairways  
Balconies  
Prismatic Lights  
Area Gratings  
Jail Work  
Fire Escapes  
Wire and Iron Fencing  
Wire Signs  
Iron Reservoir Vases



Wire and Iron Lawn Furniture

**ORNAMENTAL WIRE, IRON, BRASS AND BRONZE**

# DO YOU BELIEVE IN SIGNS?

Our Signs Will Outlast Your Belief

**PARK AVE.**

STREET SIGNS  
3 1/2" x 16"

**AUTO INN  
TROY 9 M→**

Patents Pending

ROAD SIGNS  
12" x 28"

**BAGGAGE ROOM**

RAILROAD STATION SIGNS  
3 1/2" x 24"

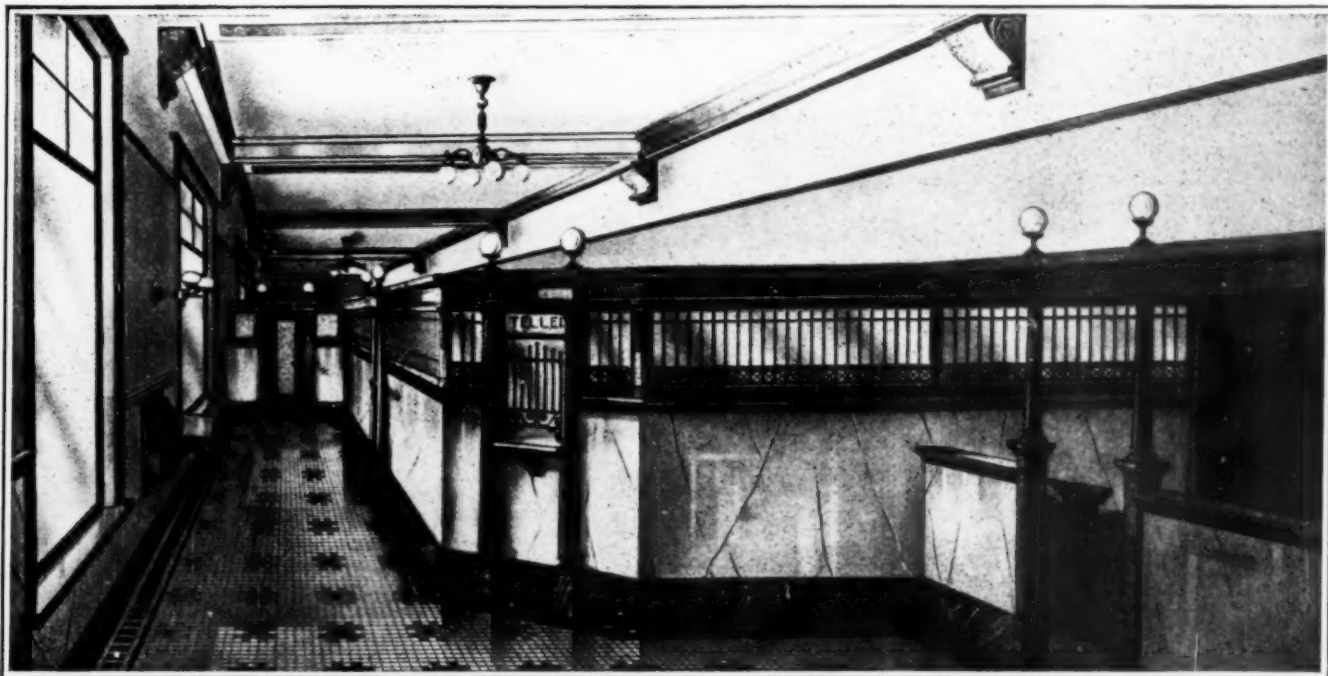
Signs for every purpose and for any place  
Each complete in itself with black rust proof surface and without enamel or paint  
Made of Pure Ingot Iron. All sizes  
The letters are drilled deep into thick metal  
Absolutely INDESTRUCTIBLE, rust proof and economical

SEND FOR SAMPLE

**INDESTRUCTIBLE SIGN CO., 101 So. Scioto St., COLUMBUS, OHIO**

# NATIONAL SHOW CASE COMPANY

The South's Largest Fixture Manufacturers



ONE OF OUR NUMBERS

NATIONAL

BANK

STORE

DRUG

OFFICE

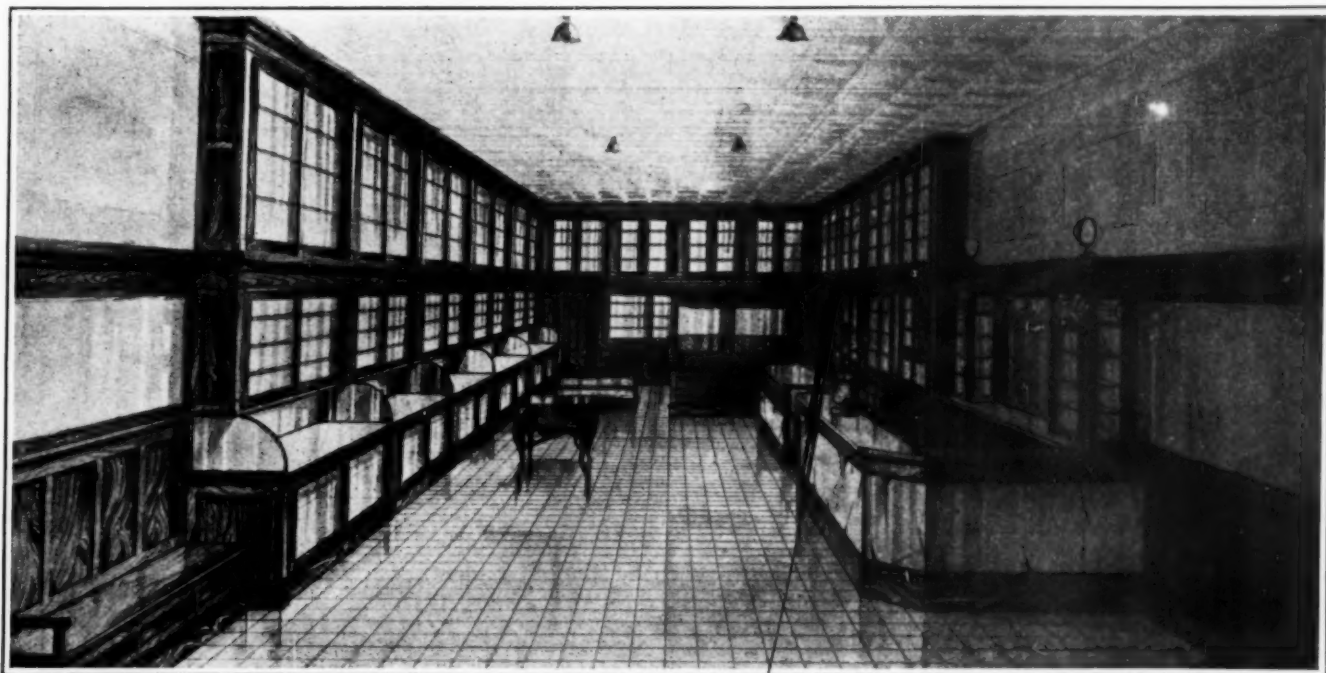
and JEWELRY

FIXTURES

OUR SPECIALTY

BANK AND DRUG FIXTURES

TRADE MARK



AN UP-TO-DATE DRUG STORE EQUIPMENT

COLUMBUS, GEORGIA



H. HAMMOND  
President

WM. M. BYRD, Jr.  
Vice-Prest.

H. L. MORROW  
Secy. & Treas.

## HAMMOND-BYRD IRON COMPANY

Coke, Coke Iron, Charcoal Iron, Domestic Coal, Steam Coal, Smithing Coal

—MANUFACTURERS' AGENTS—

CAST IRON SANITARY PIPE

1712-1717 American Trust Building

BIRMINGHAM, ALA.

### Cherokee Coal Company

General Offices, Knoxville, Tenn.

MINERS—SHIPPERS

CARYVILLE  
RED ASH  
JELICO  
BLUE GEM

# COAL

BOWLING  
COALFIELD  
PIEDMONT  
OLIVER SPRINGS

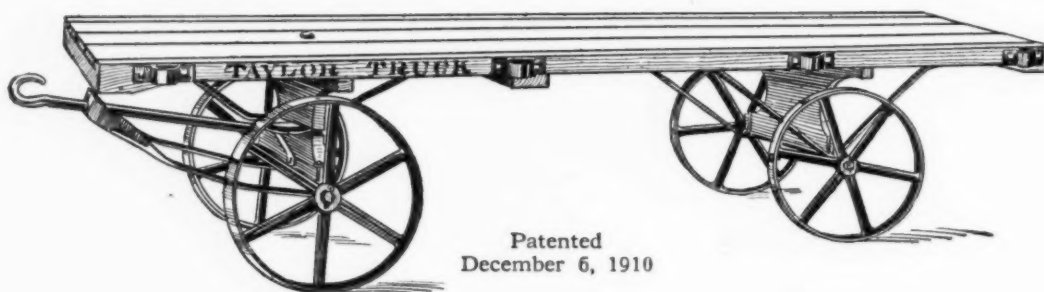
Steam and Domestic Shipments

Southern, Louisville & Nashville and C. N. O. & T. P. Railways

### Yolande Coke

The Standard of the  
South and West

YOLANDE COAL & COKE CO.  
BIRMINGHAM, ALA.

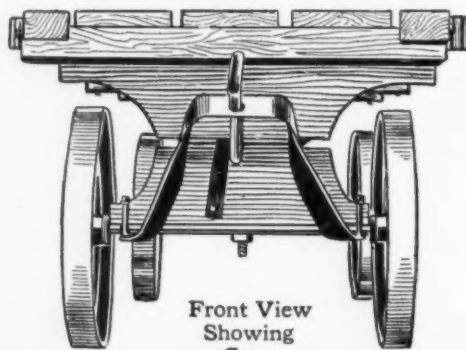


Patented  
December 6, 1910

## THE TAYLOR TRUCK

DOES THE WORK OF SIX FARM HANDS

Is practically indispensable for handling cotton, corn, tobacco, sugar cane, etc. In successful use by many progressive farmers who at once recognized the large saving effected. Will pay for itself many times over. Sturdy and strong and practically lasts a lifetime. Unlike most trucks, it will not tip over. Front gear is so arranged as to level the load on truck either going up or down steep grades. We have letters from many satisfied users that we would like to send you.



Front View  
Showing  
Gear

WRITE FOR PRINTED MATTER

### Taylor Truck Co. Newbern, N. C.

Patent Rights for States For Sale

## The Universal Ice Co.

of Atlanta invites correspondence  
from cities, towns, corporations  
and individuals concerning its

### New Method of Ice Manufacture

Plants of any capacity installed.  
Small cost. Low running ex-  
penses.

Third National Bank Bldg., Atlanta, Ga.

## Contracting Engineer

### POWER PLANTS

— Steam and Electric —

### COTTON MILL MACHINERY

### A. H. Washburn Company

Realty Building, Charlotte, North Carolina

CORRESPONDENCE SOLICITED

Machinery and Supplies for Mills, Mines  
and Railroads

Specifications and Expert Information Furnished

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117 East Bay Street

SAVANNAH, GA.

## Get Our Quotations on

Our prices compare favorably  
with Pittsburg and Baltimore  
jobbers and our deliveries are  
prompt. Our twelve years'  
experience in supplying a  
large number of progressive  
firms enables us to intelli-  
gently and satisfactorily meet  
your requirements.

MILL  
MINE  
FACTORY  
RAILROAD  
CONTRACTORS'  
AND  
PLUMBERS'  
SUPPLIES

Fred C. Dreyer Supply Co.  
CUMBERLAND, MD.

## Woodward, Baldwin & Co.

BALTIMORE AND NEW YORK

### Selling Agents

FOR THE

Piedmont Mfg. Co.	Monaghan Mills
Loray Mills	Woodruff Cotton Mills
Enterprise Mfg. Co.	Franklin Mills
Anderson Cotton Mills	Grendel Mills
Greenwood Cotton Mills	Bamberg Cotton Mills
Granby Cotton Mills	Glenwood Cotton Mills
Victor Mfg. Co.	Bregon Mills
F. W. Poe Mfg. Co.	Ninety-Six Cotton Mills
Saxon Mills	Williamston Mills
Fairfield Cotton Mills	Olympia Cotton Mills
Pickens Mill	Chiquola Mfg. Co.
The Carolina Mills	Toxaway Mills
Hermitage Cotton Mills	Brandon Cotton Mills
Woodside Cotton Mills	Lois Cotton Mills
Orr Cotton Mills	Lydia Cotton Mills
Easley Cotton Mills	Ottaray Mills
Home Cotton Mills	Eureka Cotton Mills
Richland Cotton Mills	Alice Mills
Orangeburg Mfg. Co.	Capital City Mills
Beaver Dam Mills	The Hartwell Mills
Apalache Mills	Enoree Mfg. Co.
Westervelt Mills	Wylie Mills

Pine Creek Mfg. Co.

## Sheetings

## Shirtings

## Drills

## Fine Cloths

## Outing Cloths

### Arundel Ducks

8, 10, 12 Oz., 29 Inches Wide

### Warren Mfg. Co. Ducks

12 to 146 Inches, Different Weights



# JEFFERSON EXPLOSIVES

Manufactured in Birmingham, Ala.

## Insure Prompt Shipment of Fresh Goods on Short Notice to all Southern Points



WRITE FOR  
PRICES  
ON YOUR  
REQUIREMENTS

The only Independent Company Manufacturing Dynamite and Black Powder in the South.

Our goods are made to suit conditions in Southern Territory and the central location of our factory permits of quick delivery on short notice.

Get our prices on your requirements in the South.

For Deep Plowing and Improving old, worn-out farm lands, use

**Jefferson 40% Ammonia  
Low Freezing Dynamite**

Write For Free Booklet

**"WHAT DYNAMITE WILL DO FOR THE FARMER"**

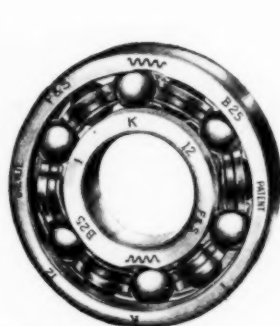
# JEFFERSON POWDER CO.

1504 EMPIRE BUILDING  
BIRMINGHAM, ALA.

## The J. S. Bretz Company Announce a New **F & S** Ball Bearing for 1913—Fitted With Their New Blue Ribbon Retainer

*"—the good plan itself, this comes not of its own accord; it is the fruit of genius, which means transcendent capacity of taking trouble first of all."*

—CARLYLE



F. & S. BEARING COMPLETE



F. & S. OUTER RACEWAY AND BALLS



F. & S. INNER RACEWAY



F. & S. BLUE RIBBON RETAINER

**F**OR 1913 Messrs. Fichtel & Sachs of Schweinfurt, Germany, manufacturers of the well known F. & S. radial and thrust ball bearings, have recently added a new type of ball separator to their other types, the most prominent of which, of course, has been the die-cast aluminum separator so well known in the various arts and industries in which it has been employed. The new separator, a one-piece steel separator, will be known as the "Ribbon" type. This separator is formed from a patented, one-piece unit sheet steel stamping, drawn and formed without joints, welds, or rivets in its construction. The separator itself is heavily corrugated and ribbed on one side for added stiffness, and finished in gunmetal blue; it is light in weight and frictionless.

Its use permits of normally grooved raceways of deeper cross-section than any other make. Its correct radius lines thus adding enormously to the lateral wall strength of the inner and outer raceways.

The radius of curvature of the raceway on the inner race is made somewhat smaller than that of the outer race, since looking at both races sideways, the outer race curves in a manner concave to the ball and the inner race convex; the outer race, therefore, encloses more of the ball than does the inner race.

The four illustrations show the construction and also show the complete assembled bearing. There are a whole lot of advantages justly claimed for this new form of construction which has been under test and actual use for over a year, and one of the main features of the bearing with the new separator is that it permits of unlimited high speed and vibration, besides which the retainer cannot be affected by heat.

The new retainer permits the use of larger balls, and in many of the sizes, a larger number of balls, which has always been a predominant feature of F. & S. ball bearings of every type, on account of their transverse side

entrance ball filling slot construction on the inner and outer rings on one side.

The bearings are made in standard ball-bearing sizes, interchangeable with other makes. They do, however, differ from others, in having a higher load carrying capacity and greater endurance, due to the larger number of balls contained in the bearing.

This statement of the quantity of balls used, however, does not hold in all the sizes, since this "Ribbon" type of separator requires the use of an even number of balls, and hence in the design in sizes where an odd number of balls was previously used, it has required a negligible decrease rather than an increase in the number of balls; but as the load capacity of the bearing varies as the square of the ball diameter, and directly with the number of balls, it is obvious that an increase in the diameter of the balls more than compensates for the slight decrease in their number. In many of the sizes, increase in load capacity runs as high as 30 per cent. The "Ribbon" type of separator also permits of a much freer circulation of the lubricant, and lessens the probability of foreign particles being retained in the separator. It is also true that the new type of ball bearing operates even more quietly than does the aluminum type of separator.

A self-aligning type of radial bearing has also been added to the line. This type consists of a standard bearing with a spherical surface on the outer race, and the addition of a washer with a spherical inner surface. This permits of adjustment in case of shaft deflections.

On account of recent large addition to the already great plant, F. & S. are now able to produce special bearings to inch dimensions, or other special constructions, without interfering with their standard production. It may be of interest to note that a recent official accountant's tabulation of outputs developed the fact that over 50 per cent. of the ball bearings produced in the German Empire were manufactured by Fichtel & Sachs.





Just As  
The South  
Is The Nation's  
Greatest  
Asset  
So

## The Gandy Belt

is one of the South's greatest assets:

Made in the South, (Baltimore, Md.) and from the South's splendid cotton, it carries its fame to all the ends of the earth.

THE BELT FOR IN-DOOR WORK AS WELL AS FOR WORK OUT-DOORS. Not affected by the weather—never hardens and runs absolutely true.

Its first cost is only about one-third that of leather belting; it is much cheaper than rubber belting, while it does the work equally as well as either leather belting or rubber belting.

To protect you against inferior imitations look for the three identifying marks:

- 1—The Green Edge
- 2—The Gandy Trade Mark
- 3—The Brand "The Gandy Belt"

Our enormous stock enables us to fill orders on day received and to ship seasoned belts.

When buying belts remember "The Gandy Belt." It will save you money.

**GANDY BELTING CO.**  
BALTIMORE, MD.



The Trade-Mark  
of Excellence

## Rubber Goods

**Hose** for Water, Steam, Gas, Air, Oil, Suction and Fire Protection. Each kind of hose is made from high grade materials and is constructed with especial regard to the kind of service intended.

**Rubber Belting** for Power Transmission and Conveying. Is waterproof, is unaffected by steam or acid fumes, and is adapted for use indoors and out-of-doors. It costs less than any other absolutely and permanently waterproof belt.

**Packings** for Piston and Valve Rods, Flanges and Joints—in great variety—adapted for all purposes.

VALVES      DIAPHRAGMS      TUBING  
GASKETS      SPRINGS

Manufactured by

**BOSTON BELTING CO.**

BOSTON      NEW YORK      CHICAGO  
BALTIMORE      BEAUMONT, TEXAS      ATLANTA      NASHVILLE

# General Asbestos and Rubber Co.

MANUFACTURERS OF

## HIGH GRADE PACKINGS

===== FOR =====

Steam, Air, Oil and Ammonia

===== ALSO =====

Garco Asbestos Brake Band Lining

===== FOR =====

Automobiles, Motor Trucks and Friction Drums

For Hoists, Elevators and Cranes

We make a specialty of ASBESTOS TEXTILES.

For full particulars and prices, write for Catalogue "C".

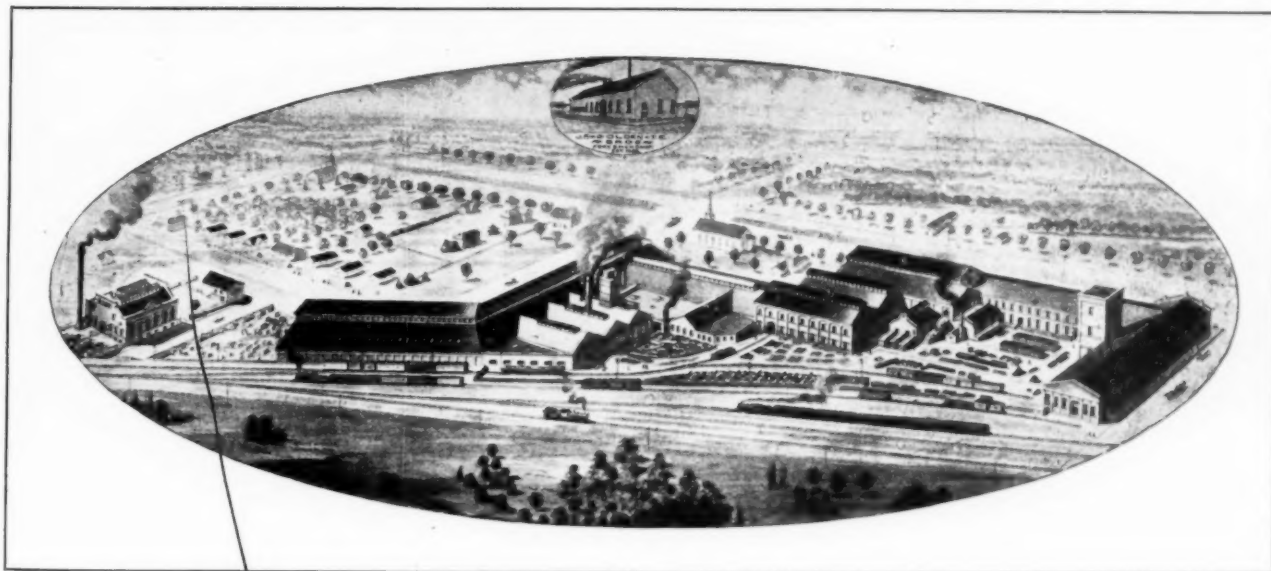
MAIN OFFICES AND FACTORIES

**CHARLESTON, SOUTH CAROLINA**

Branch: Pittsburgh, Pa.

# Goldens' Foundry and Machine Company

COLUMBUS, GEORGIA, U. S. A.



MANUFACTURERS OF

Machine Moulded Pulleys,  
Hangers, Shafting,  
Couplings, Collars,

Pillow Blocks,  
Wall Frames,  
Rope Sheaves,

Boiler Fronts,  
Grate Bars,  
Lumber Trucks, Etc.

SEND FOR PRICE LIST AND DISCOUNT SHEET

## THE BAILEY-LEBBY CO.

### MACHINERY AND SUPPLIES

GIANT Seamless and Stitched RUBBER BELT

CITADEL RUBBER BELT

BIRD'S BULL'S EYE BELT

GENUINE GANDY BELT

DETROIT OAK TANNED LEATHER BELT



#### PHOSPHATE SUPPLIES

Fertilizer Carts

Barrows

Shovels

Spades

REX FLINTKOTE ROOFING

MIKADO ROOFING

BAILECO RUBBER ROOFING

CORRUGATED AND V-CRIMP ROOFING

Metal and Wood Working Machinery, Steam Pumps, Boilers, Engines, Saw Mills, Jeffrey Conveying and Elevating Machinery  
Dodge Transmission Machinery

Leschens Wire Rope

Columbian Manila Rope

THE BAILEY-LEBBY CO

*Baileco*  
RUBBER  
ROOFING  
CHARLESTON, S. C.

Mill, Mining and Railroad Supplies

CHARLESTON, S. C.



# The Cameron & Barkley Company

CHARLESTON—JACKSONVILLE—TAMPA

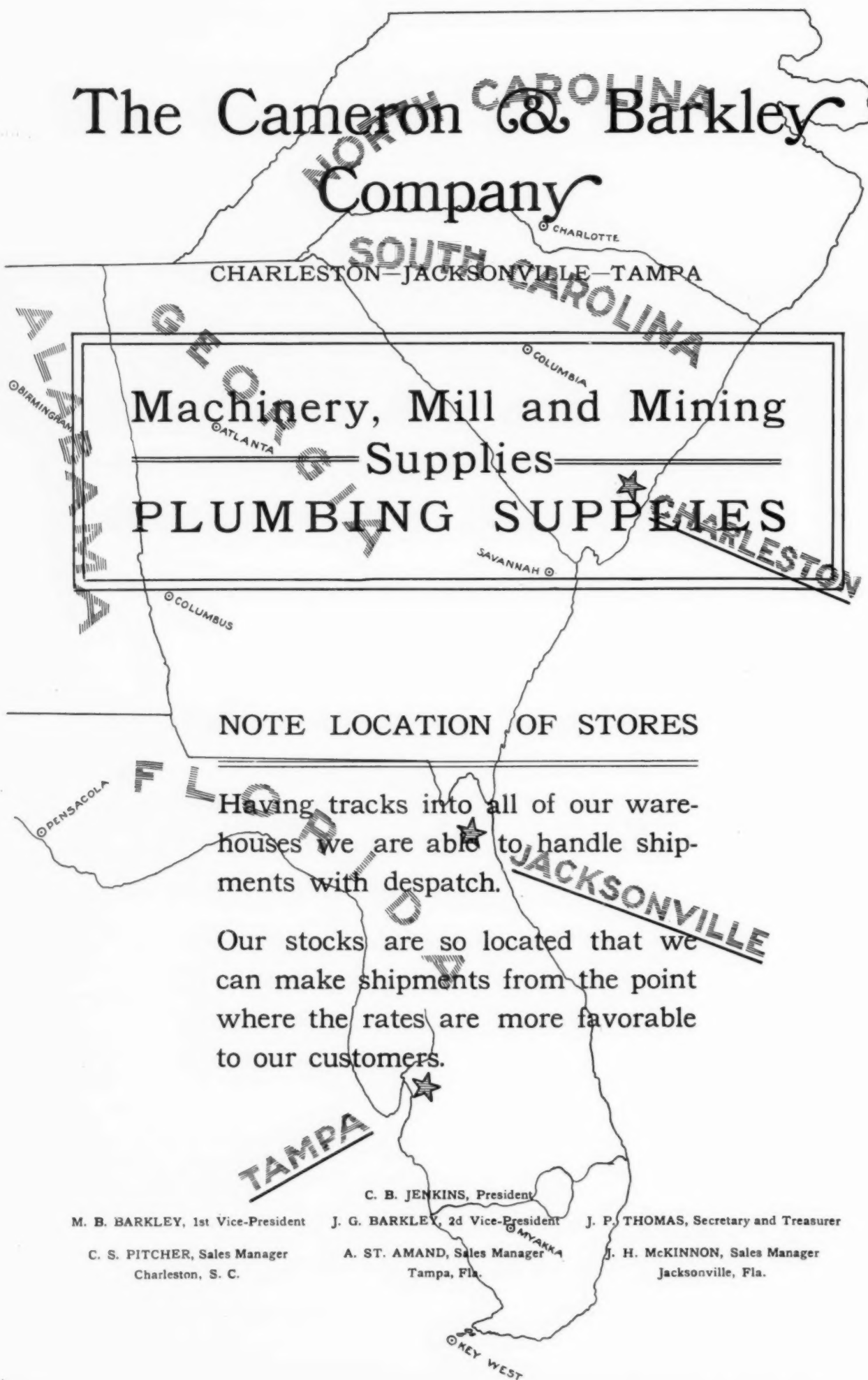
Machinery, Mill and Mining  
Supplies  
PLUMBING SUPPLIES

## NOTE LOCATION OF STORES

Having tracks into all of our warehouses we are able to handle shipments with despatch.

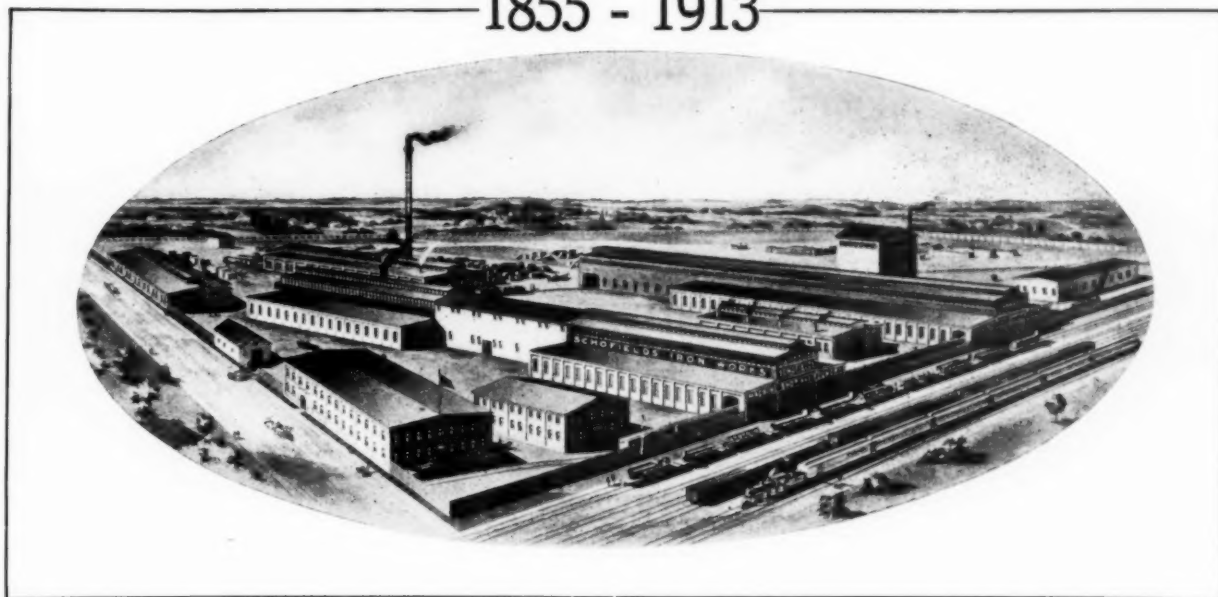
Our stocks are so located that we can make shipments from the point where the rates are more favorable to our customers.

M. B. BARKLEY, 1st Vice-President	J. G. BARKLEY, 2d Vice-President	J. P. THOMAS, Secretary and Treasurer
C. S. PITCHER, Sales Manager Charleston, S. C.	A. ST. AMAND, Sales Manager Tampa, Fla.	J. H. MCKINNON, Sales Manager Jacksonville, Fla.



# SCHOFIELD IRON WORKS

1855 - 1913



In the above plant with the most modern equipment, and skilled mechanics, we produce the

## SCHOFIELD

Horizontal Tubular Boilers

Plain Slide and Balanced Valve Engines

Vertical Tubular Boilers

Towers, Tanks and Standpipes

Internal Furnace Boilers

Self-Supporting Steel Stacks

Also Phosphate Dryers and Phosphate Machinery a Specialty

And all kind of Plate and Sheet Iron Work

Fifty-seven years of successful building and installing power plant equipment have justly given Schofield's Products a reputation for quality and reliability.

Our plant has every facility to insure a rapid production of high grade equipment at the minimum cost, and our location especially fit us to satisfactorily handle Southern trade.

We always carry in stock, ready for immediate shipment, boilers ranging in size from 12 H. P. to 150 H. P., built to carry a working pressure of either 100, 125 or 150 lbs.; also Centre Crank Engines from 10 H. P. to 100 H. P., and Side Crank Engines from 50 H. P. to 150 H. P.

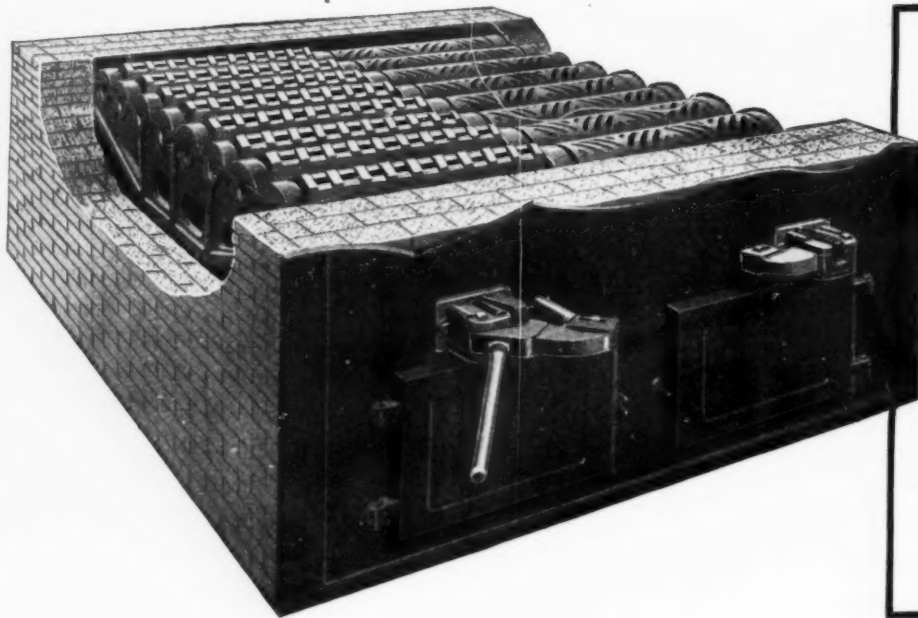
On all other equipment we can guarantee a prompt handling of your order and very reasonable terms. Let us quote you on your future needs, including your Mill Supplies.

Catalog on Request

**J. S. SCHOFIELD'S SONS CO.**

MACON, GEORGIA





### ALABAMA FUEL & IRON COMPANY

Birmingham, Ala., Dec. 12, 1912.

YOUNG & VANN SUPPLY CO.,  
Birmingham, Ala.

Dear Sirs:—You will please ship us promptly to Colgate five additional sets of the THOMAS ELLIPTIC GRATE BARS, shaker pattern. These will totally equip this plant. It may be interesting to you to know that the set of bars you sold us for testing out in this plant verified all the claims you make for them.

Please ship us another set of these same bars for our Acmar plant, which fully equips that plant. The guarantee of Mr. Thomas to operate this plant with one boiler equipped with these bars, burning run of mine coal, has been fully and satisfactorily demonstrated.

Yours truly,

(Signed) CHAS. F. DeBARDELEBEN,

d-w

Vice-Prest. and Gen. Mgr.

## One of the Many Repeat Orders For THOMAS Elliptic Grate Bars

Be sure and read the above letter. Note the order for two different plants, and this is after a thorough test. Also note that the Bars verify every claim we make for them, and that plant is being run with one boiler and using "run of mine" coal. There's economy for you. Efficiency and simplicity is also there. We have hundreds of "letters of praise" from satisfied users. THOMAS ELLIPTIC GRATE BARS are made in all styles and sizes, and for all purposes. They burn any kind of fuel, and burn all of it. Self-cleaning and guaranteed for 12 months. They will save money for you.

Made in the South and used everywhere.

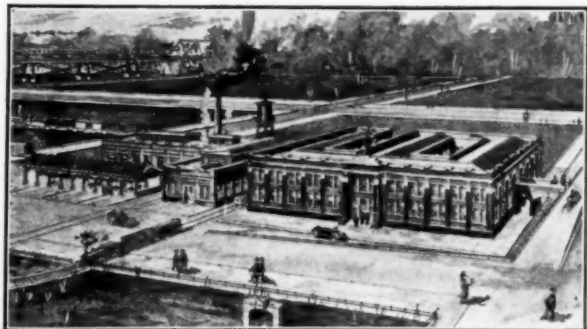
Write for printed matter.

# Thomas Grate Bar Company

BIRMINGHAM, ALA.

Branch: Valdosta, Ga.

ESTABLISHED 1877.



Long Distance Telephones

A. M. GIBBES, Proprietor

## GIBBES MACHINERY CO.

### Manufacturers and Jobbers

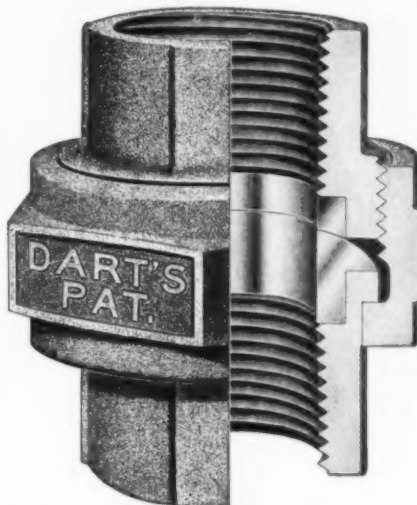
Steam and Gasoline Engines, Boilers, Ginning Machinery, Saw Mill Machinery, Corn Mills, Brick-Making Machinery, Shingle and Lath Machinery, Planers, Edgers, Swing and Drag Saws, Wood-Working Machinery Generally.

Near Union Station

Columbia, S. C.

## DART UNIONS

Have Bronze to Bronze at the Joint — no Corrosion



The Bronze to Bronze combination, in the vital part, the seats, settles the question of corrosion.

This construction is embodied in our Flange Elbow, Tee, Male and Female and Air Pump Unions. If you know the Dart Unions, you need no

proof of its superiority. If not, we would like to send you a Dart Union Free for a test.

Printed matter on request.

## E. M. DART MFG. CO.

PROVIDENCE, R. I.

THE FAIRBANKS COMPANY, Agents

Canadian Factory: Dart Union Co., Ltd., Toronto

Builders of High Grade

## BOILERS

ALSO

Stand Pipes, Self-Supporting Stacks, Tanks, Towers, all kinds of Structural and Plate Iron Work, Boiler Fronts, Grate Bars, all kinds of Castings.

## Hartley Boiler Works

MONTGOMERY

ALA.

## Plymouth Rope Won Out

A southern rope buyer, in the market for six coils of Manila rope, got a price of 15 cts. per pound from our agent.

A competing rope was offered at 14½ cts.

Comparison of the two ropes showed the *true* difference in price as follows:

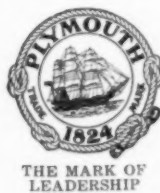
Competing Manila in 1200 ft. coils  
4 coils 7/8" dia. 130 lbs. each=520 lbs.  
2 coils 1" dia. 100 lbs. each=200 lbs.  
720 lbs. at 14½ cts.= \$104.40

Plymouth Manila in 1200 ft. coils  
4 coils 7/8" dia. 120, 121, 123,  
122 lbs., respectively=486 lbs.  
2 coils 1" dia. 88, 89 lbs.  
respectively=177 lbs.  
663 lbs. at 15 cts.= \$99.45

Plymouth actually cost \$4.95 less for the same number of feet than the other rope.

Plymouth Rope won the order. It always wins with the buyer who wants *highest quality* and takes pains to get it.

Isn't *quality* what you are looking for in rope?



Plymouth Cordage Co.

North Plymouth, Mass.





## Ask For A Copy Of This Book

"How and Where Pumping Costs Can Be Reduced"

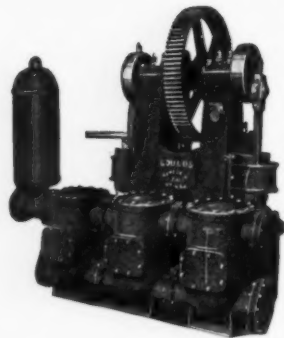
It gives data on plants where savings of two-thirds and more have been made in the cost of pumping. It may suggest a way in which you can make a similar saving.

### Goulds Efficient Power Pumps

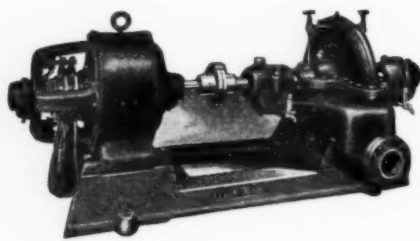
are made in all types and capacities for every service. Whatever your requirements may be, there is a Goulds Efficient Pump that will give just what you want.

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THE **GOULDS** MFG. CO.  
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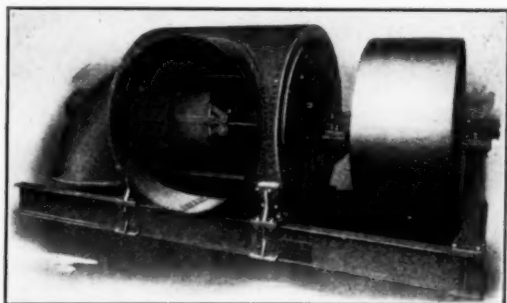
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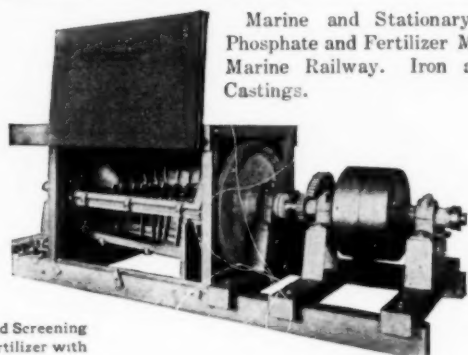


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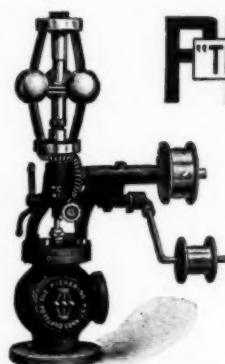
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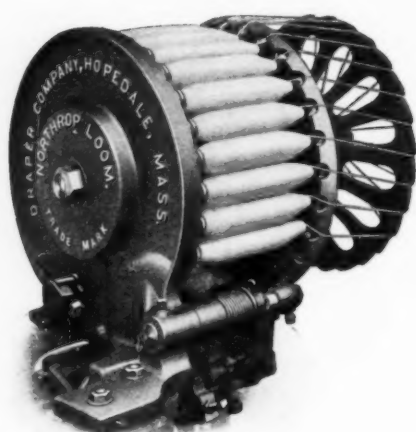
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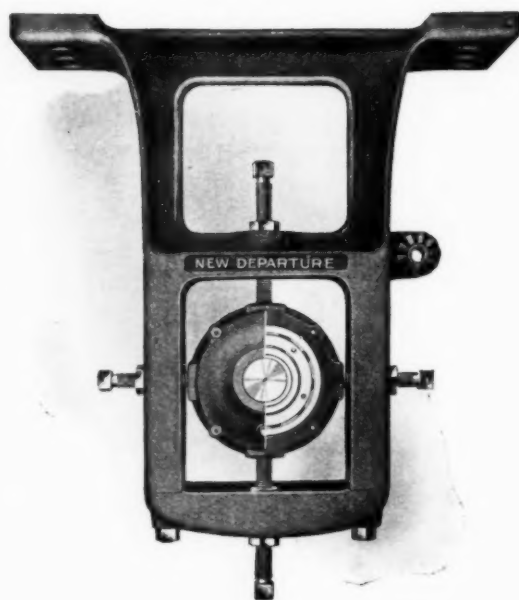
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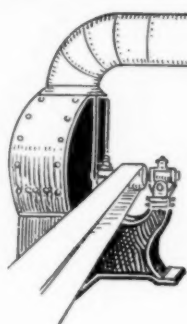
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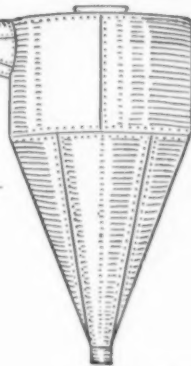
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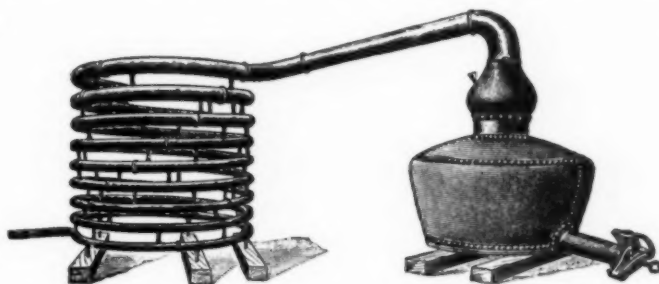
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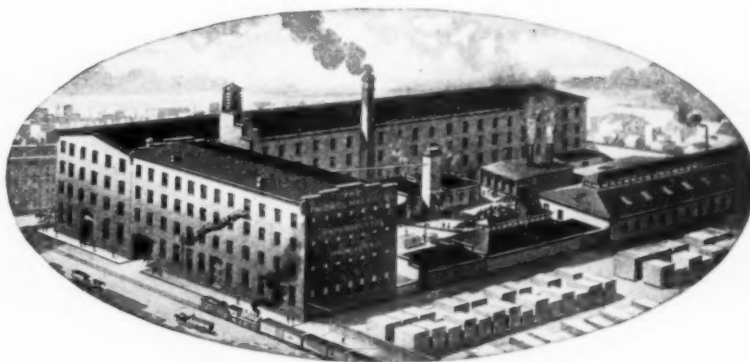
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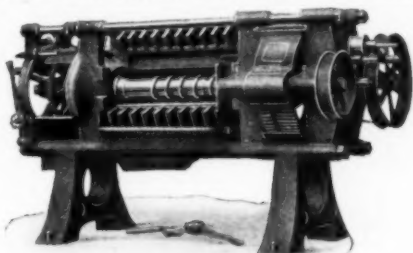
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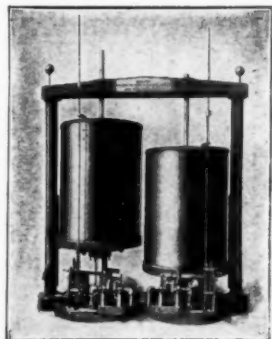
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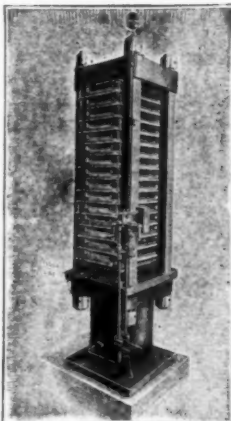
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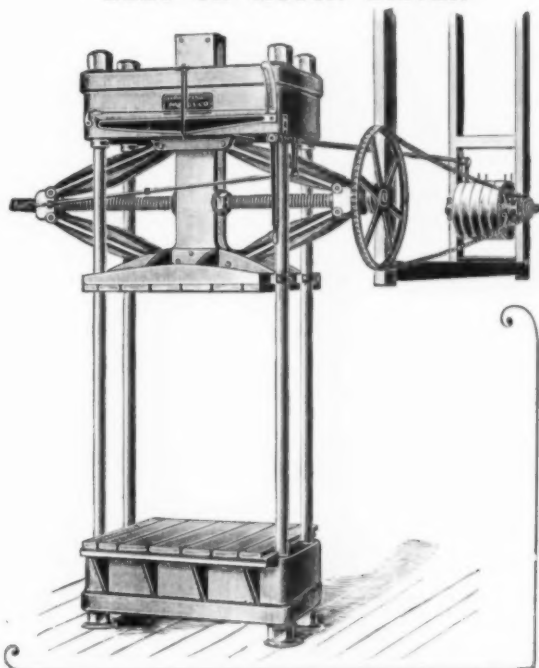
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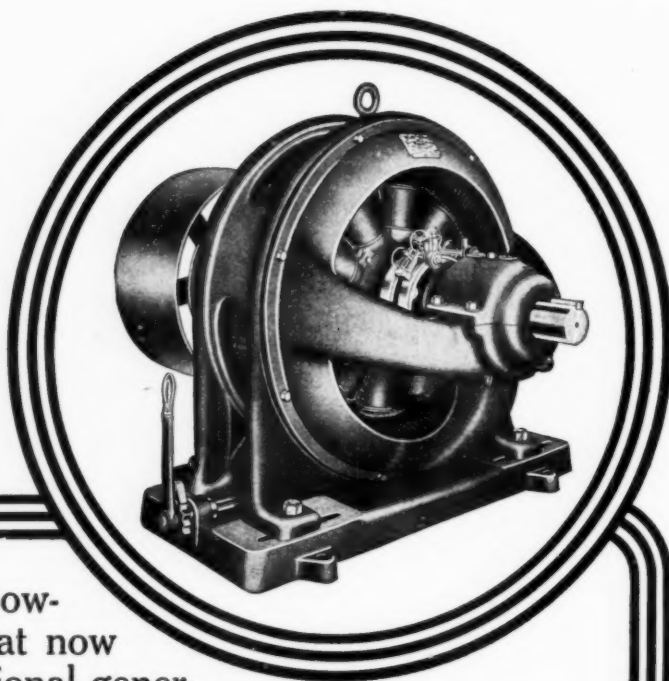
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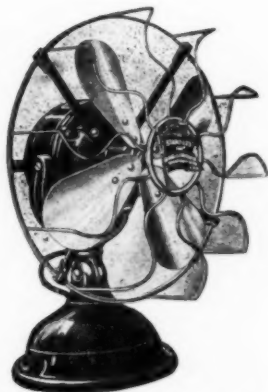
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A year ago in the "Southern Upbuilding" number we stated that Terry turbo-pump sets with a total capacity of nearly 50,000 gals. per min. were in use in the South. Today our calculations show that Terry turbo-pumps with a total capacity of over 100,000 gals. per min. are used by Southern companies! What better evidence could we give of the South's full endorsement of Terry Turbines for driving boiler feed, condenser, hot well, fire, sweet water, irrigation, and water-works pumps?

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## II



## II

## II



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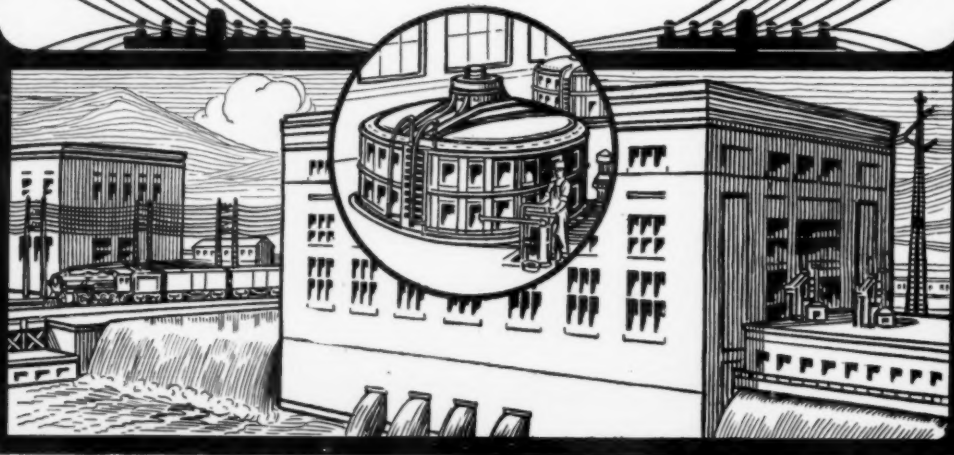
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# THE SOUTHEASTERN STATES

## The Favored Region of America



Location in reference to the great centers of population of America; in transportation lines to the markets of all the rest of the United States and of the world; in nearness to the Panama Canal; in a pleasant, healthful and fruitful climate; in the character and productivity of the soils and low prices of lands; in the wide variety and excellence of agricultural and horticultural products and the profits from their growth; in great forest and timber wealth, and the water-power and other natural resources, the Southeastern States occupy the commanding position in the United States or in America.

The arrested growth years ago of this section has made it today the region of greatest opportunities for farm, manufacturing and other development to be found anywhere in the country.

These States are now in the midst of the greatest development known in their history; are having in every way a rapid and remarkable growth along all lines.

To industrial enterprises the iron ore deposits, the coal deposits, the marbles and stones and fine clays, the hardwood and pine forests and the favorable labor conditions offer in all lines the greatest advantages. The rapid growth of the section, the fine transportation facilities and the peculiar advantages in many ways make the opportunity for new industrial enterprises the widest and the most attractive. New opportunities are steadily developing. In a wide line of manufacturing it has been found that the Southeast can turn out and market products at a cost which cannot be met elsewhere.

The influx of outside capital, the great attention given to permanent improvements in the cities, to high-grade country highways, to the advancement of agriculture, to education and to all lines of endeavor are now giving the Southeast the most substantial progress. The continued growth of the country is assured along all lines and in the most rapid way.

The beauty of the mountain and upland and coastal regions, the wonderfully pleasant climate the year round, the pure water supply and other advantages make the Southeast a most attractive region for homes.

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Nearly all the richest agricultural lands in the Southeast; the finest fruit-growing regions (there are no better in all the world); the greatest mineral sections, with their ores, coal, limestones, granites, marbles, clays, micas and other minerals; the largest hardwood forest areas, the great water-power developments and possibilities, the chief cities, and the most successful and best developed manufacturing centers are reached by the lines of the Southern Railway, the Mobile & Ohio Railroad, the Georgia Southern & Florida Railway and the Virginia & Southwestern Railway.

In these districts the manufacturer, the investor and the homeseeker will find splendid opportunities. The Land and Industrial Department of these roads is maintained to cooperate with and assist all who may be seeking locations or opportunities in the Southeastern States. It will furnish, on request, booklets and other printed matter giving information, assist in investigations, and in the securing of factory sites and farm or orchard lands without expense to the inquirer.

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## “The Promised Land of Health and Prosperity” is Florida

Between 1900 and 1910 the population of the United States increased.....	21 %
During the same period the population of Florida increased.....	42.4%
The increase in value of farm lands in the United States between 1900 and 1910 was.....	118 %
The gain in Florida during the same years was.....	203 %
The value of Florida's 12 leading diversified crops common to most of the country (and not including the citrus crops, so large a factor in the agricultural interests of this State) increased from \$6,677,000 in 1899 to \$15,104,000 in 1910, a gain of.....	126 %
The gain in the whole country for the same crop was .....	81.1%
Between 1900 and 1909 capital invested in factories increased in the whole country .....	108.8%
In Florida the rate of gain was .....	152.6%
The value of factory products increased during the same time in the United States .....	81.7%
The value of factory products in Florida increased.....	112.7%

In each one of these comparisons the rate of increase in Florida was far greater than that of the entire country during the same period.

These remarkable illustrations of well-rounded progress combine to emphasize the wonderful agricultural and industrial activities and possibilities of the State.

This growth, while showing a great percentage of increase in the last decade, has been a steadily advancing one; and when the many large undertakings that are under way in Florida, such as the draining of the Everglades, extension of railroads, developing of new farming and trucking areas, etc., are considered, all of which will open up opportunities of even wider magnitude, a much greater advance can be safely predicted for the next ten years.

A State which is drawing an ever-increasing number of health and pleasure seekers, of permanent settlers—some to engage in general agriculture, some in manufactures, some in fruit growing—oranges, grapefruit or kindred interests, some in trucking, some in dairying, and some in chicken raising—is an ideal land for investigation on the part of those who want

**The most perfect all-the-year-round climate to be found in America;  
Manufacturing and agricultural advantages of vast and varied extent;  
Transportation facilities that are rapidly being extended to meet the  
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Florida is the State.

“The Call of Florida” is being heard throughout the land. Toward Florida thousands of people are turning their faces as to the “Promised Land of Health and Prosperity.” The progress of the last ten years is only a hint of what the future will show.

Active, energetic, live people want to live in an active, energetic, live community, where the tide of incoming population gives every man a chance to develop every latent power in him.

Florida is the place.

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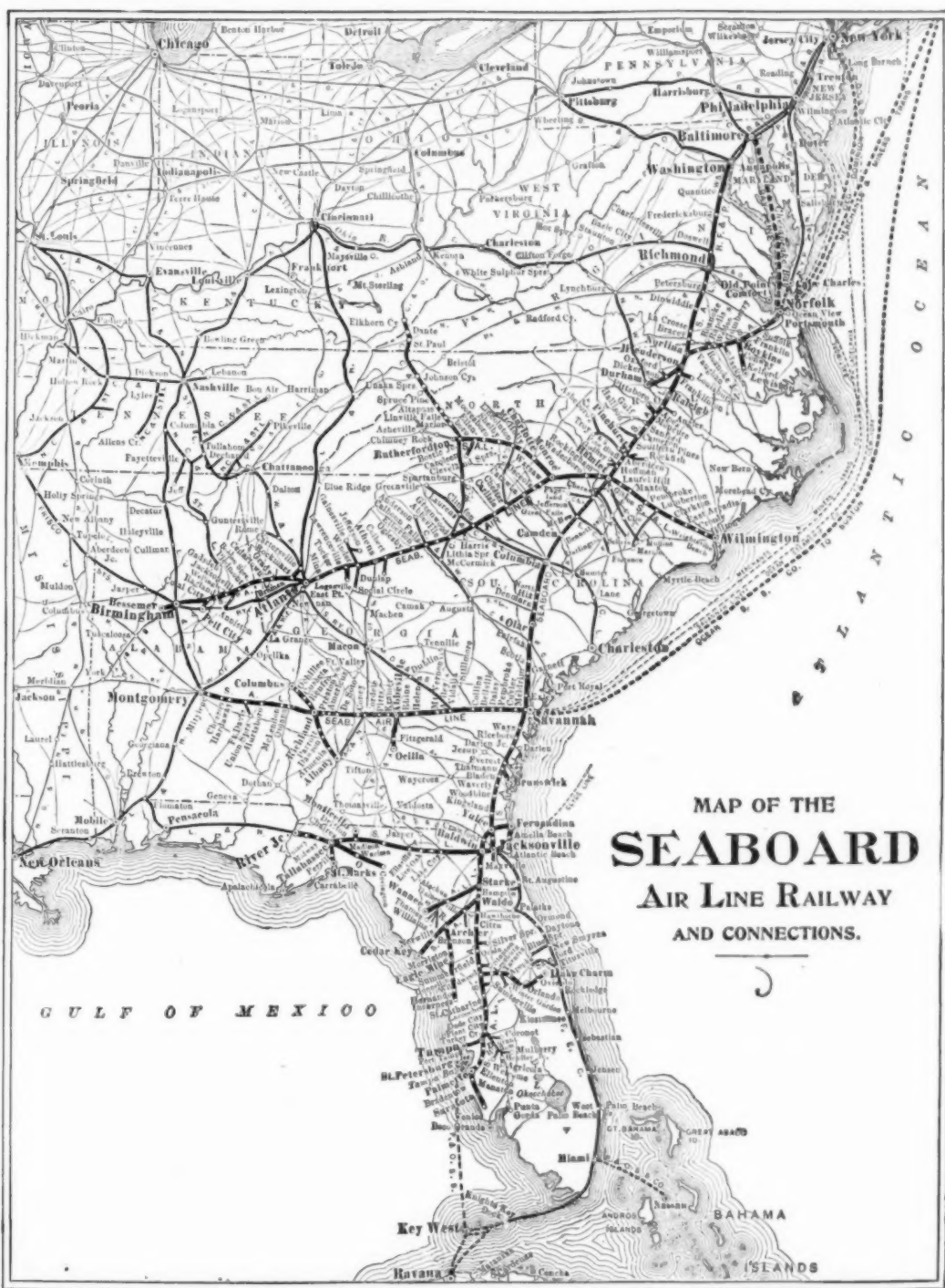
J. E. INGRAHAM, Vice-President

ST. AUGUSTINE, FLA.

# SEABOARD AIR LINE RAILWAY

From Richmond, the all-rail gateway, through Washington to the East, and Norfolk, Hampton Roads to the Gulf of Mexico, the Seaboard serves the richest portion of the South.

Through the heart of the Carolina cotton manufacturing and hydro-electric development area. The manufacturing centers and rich farm lands of the Empire State—Georgia. To the center of the South's iron, steel and cement industry at Birmingham.



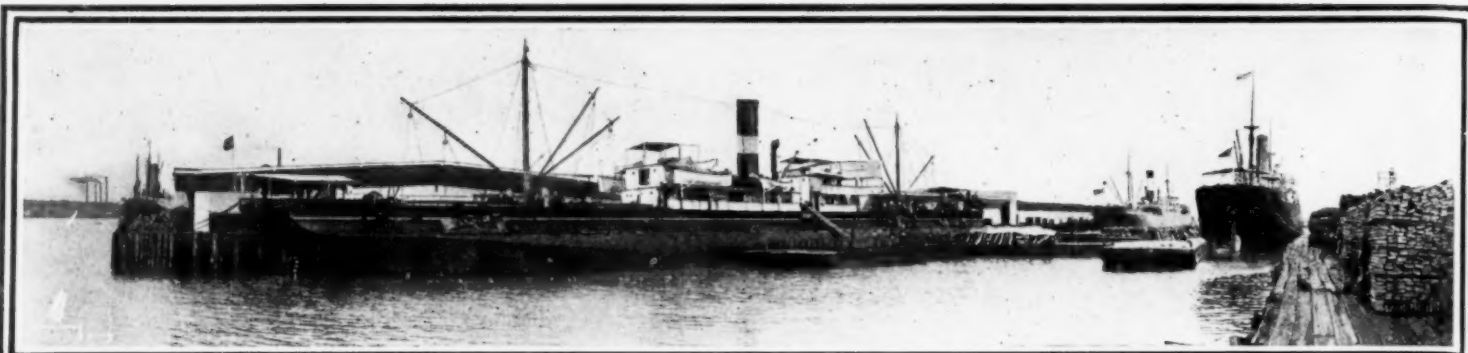
## SPECIAL HOMESEEEKERS' RATES

The great tide of homeseekers is rapidly turning toward the South, and thousands of fertile acres along the Seaboard are attracting the attention of many desirous of making homes in a climate healthful and pleasant and on a soil the most productive.

## Seaboard Air Line Railway

J. A. PRIDE, General Industrial Agent, 702 Royster Building, NORFOLK, VA.





SAVANNAH TERMINAL OF THE SEABOARD AIR LINE RAILWAY.

## The Seaboard's Rich Territory

Virginia—North Carolina—South Carolina—Georgia—Florida—Alabama

**T**HE Seaboard's territory, through the six Southern States traversed, presents many attractive opportunities for industrial and agricultural development. Raw material of great value is in abundance, and this territory is one of peculiar value to the manufacturing industry. With the opening of the Panama Canal and the large possible interchange with the South American States, the Seaboard's territory has a valuable and attractive location, touching the deep-water ports of Norfolk, Wilmington, Savannah, Jacksonville, Fernandina and Tampa, offering ready access through the Canal to South America and the Far East. The seventy million people in the South American States buy largely of cotton goods, iron articles, plows and other agricultural implements, all of which can be economically produced in the Seaboard's territory within a short line radius of the deep-water ports mentioned.

This territory produces 50 per cent. of the cotton crop. Within its borders are one-half of the twenty-nine million active cotton spindles of America.

**COAL  
IRON  
CEMENT MATERIALS**

**CLAYS  
TIMBER**

**COTTON  
PHOSPHATE  
FULLER'S EARTH**

offer wide opportunity for the successful manufacture of these essential articles.

The agricultural development has grown in importance and value. There are yet many thousands of acres of land which offer an opportunity of value to the agriculturist who is seeking for a home in a

climate equable and healthful, and in an area where outdoor pursuits are possible the year round. The U. S. Department of Agriculture says:

"The South Atlantic States cover one of the richest areas of undeveloped agricultural wealth in the United States."



A CHARLOTTE (N. C.) MODERN COTTON MILL.

Richmond, southward through the **VIRGINIA** Roanoke River

Valley, in the counties of Dinwiddie, Brunswick and Mecklenburg, are thousands of acres of high, rolling pasture lands, ideal for cattle, poultry, dairying, small fruits and general farming. Immediately adjacent to this territory are the greatest markets for food products in the world. Between Richmond and Boston there is a population of twenty-eight and one-quarter million people—millions of workers in shop, store and mill, who must be fed from Southern farms. Lands can be secured in this healthful and attractive section for \$7 per acre and up, and here is an opportunity for much development.

The sand hill area of North Carolina, in the counties of Moore and Richmond, is attracting wide attention to its fertile soil and very healthful conditions, where outdoor pursuits are possible the year round, and the cultivation of dewberries, melons, peaches and the general farm crops yields remunerative returns. The Government's tests show one hundred and forty-three bushels of corn to the acre on a Moore county farm. The Coastal Plain, through the counties of Scotland, Robeson, Bladen, Columbus and Brunswick, has about the same climate as that of France; the mean annual temperature of the sec-

**NORTH CAROLINA**

A TYPICAL FLORIDA ORANGE GROVE.





FIFTY ACRES OF CELERY AT BEE RIDGE CELERY FARM, FLORIDA.

tion is 60 degrees Fahr., and the mean annual rainfall is 59½ inches. The soils are sandy and sandy-loam, underlain with clay, friable and easily cultivated, producing largely of truck, small fruits, strawberries, cantaloupes, melons, and is one of the best cotton and corn sections of the South. Mecklenburg, with 67,000 population, the largest county in the State, is the center of the cotton mill manufacturing. Its capital, Charlotte, is one of the most progressive cities of the South, and allied with the cotton manufacturing is an immense hydro-electric development, which gives impetus to this industry.

**GEORGIA** South and west of Savannah to the capital of Alabama -- Montgomery -- the Seaboard's lines traverse counties comprising the great cotton growing empire of the South—twenty-three counties, with seven and one-quarter million acres of good soil, where cotton is being produced in great quantities, and where the deep-water port of Savannah offers an outlet to the cotton mill centers of the South and East, and for export to the Continent. These lines cross the Ogeechee, Ohoopsee, Oconee, Ocmulgee, Flint, Chattahoochee, Savannah, Altamaha and Satilla rivers, along which are much excellent timber awaiting manufacturing and many good situations for water-power development. Thousands of acres of rich bottom land and many acres adapted to the grasses and successful cattle raising.

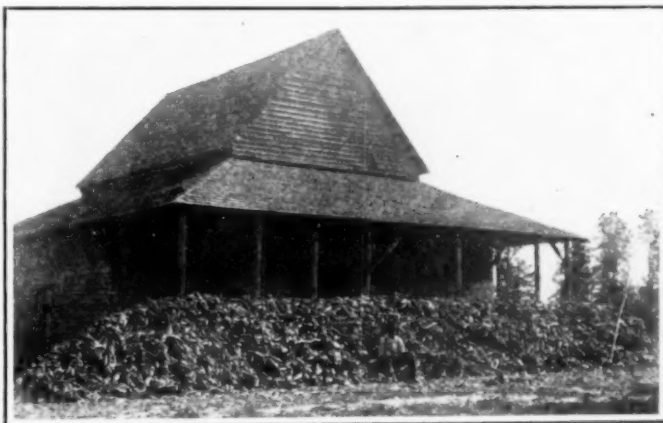
The clays for brick and fireproofing making are great in extent and very valuable. There are possibilities here for many new industries and largely increased agricultural development.

The Piedmont region, high, healthful and fertile, through the counties of Elbert, Madison, Clarke, Jackson, Gwinnett, Fulton, Cobb, Paulding, Polk, Bartow and Walton, produce a grade of upland cotton very much sought after by the spinners. In this area are many sections adapted to the Elberta peach and other fruit crops.

Between Atlanta, the New York of the South, and Birmingham, the center of the South's steel and iron making industries, are attractive timber areas, iron, coal, shale for brick making and cement material, and a great opportunity for a varied line of industries awaiting development.

South of Columbia, in the Coastal Plain of South Carolina, Hampton county has under way a drainage plan to reclaim 70,000 acres of the most arable land in the South, good cotton, corn, potato and truck land, which will yield abundantly. There are deposits of very fine clay in this section awaiting development. Around Great Falls, in the rich valley of the Catawba, centers the largest of the hydro-electric power developments in the South. Cotton manufacturing and a plant to produce nitrogen by electric process have been established here. Brick making clay, fine building stone at hand. A splendid climate—cotton produced around the mill—electric power at very reasonable prices—good labor supply—ready transportation facilities.

#### SOUTH CAROLINA



CORN—14 BUSHELS TO THE ACRE IN NORTH CAROLINA.

Jacksonville's area is one which **FLORIDA** has many attractive features for manufacturing and agricultural development. The early Irish potato lands in Duval, Bradford, Baker, Clay and Sumter counties readily yield two crops of this widely used vegetable. Lands can be had at very reasonable prices, and are in line for enhancement in value.

Orange, Lake, Marion and Sumter counties are very attractive, interspersed with beautiful lakes and rich lands adapted to truck, vegetables and citrus fruit.

Leon, Gadsden and Jefferson counties, the highland section of the State, for general farming, cattle raising, dairying, poultry raising, are very attractive areas within easy reach of splendid markets.

Citrus, Hernando and Polk counties, the center of the phosphate rock-producing industry, offer wide opportunity for the expansion of this line of endeavor, as well as timber manufacturing and the cultivation of the very fertile truck and fruit lands.

South of Tampa lies Manatee, the great frostproof citrus center and vegetable garden of the State, 800,000 acres of splendid land with a shore front on the Gulf of Mexico extending fifty miles—climate good the year round—traversed by the Manatee, Braden and Alafia rivers, and indented by many beautiful bays and sounds—acreage production equalling \$1500 can be shown—sugar-cane and the manufacture of syrups and sugar presents a very great opportunity for investment of capital. The establishment of manufacturing plants for the canning and crystallizing of fruits and vegetables offer a new opportunity in this most attractive area, which is growing very rapidly.

*The Industrial Department has gathered facts on this attractive area, and will be glad to furnish same on application*

## Seaboard Air Line Railway

J. A. PRIDE,  
General Industrial Agent

702 Royster Building  
NORFOLK, VA.



# Atlanta, Birmingham and Atlantic Railroad

PRE-EMINENTLY PROGRESSIVE

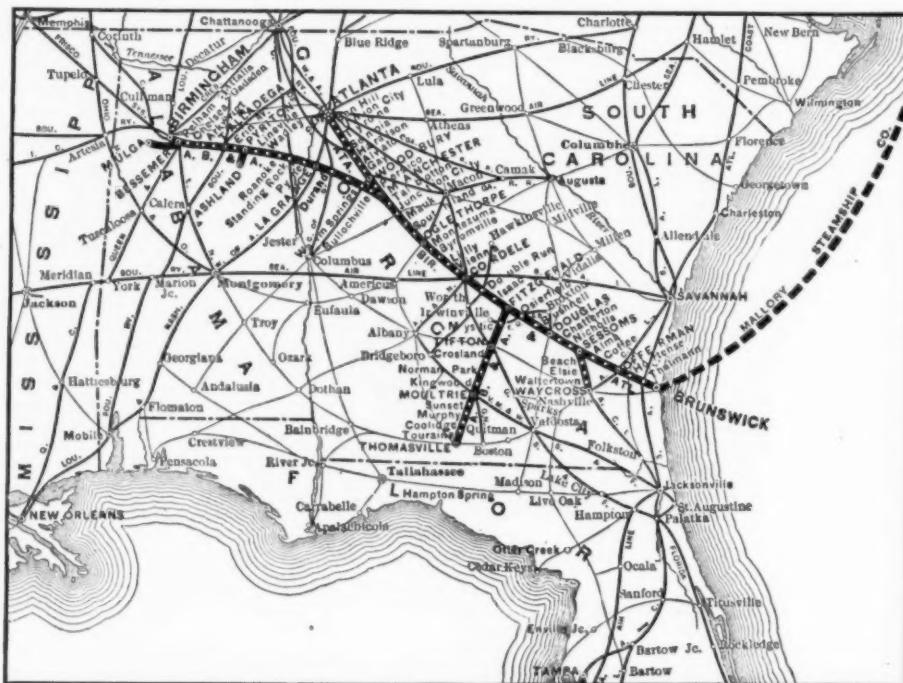
Keeping Abreast With the Development of the South

The ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD, one of the standard new lines of the South, traverses the very heart of Agricultural Georgia and Alabama. This line is built upon the highest standard of construction, and, as the map shows, reaches into the interior from the Port of Brunswick, Ga., one of the finest harbors on the South Atlantic Coast. Its rails extend westward, terminating at Atlanta and Birmingham, the gateways between the Southeast and the North, Northwest, West and Southwest. The building of this road opened up a magnificent agricultural territory, which now affords excellent transportation facilities to the markets of the North, East and West.

The total mileage of the ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD is 600. In addition to the line from Brunswick, Ga., to Birmingham, Ala., and Atlanta, Ga., the road has lines diverging from Fitzgerald to Thomasville, through the very heart of agricultural South Georgia; (Sessions to Waycross, the latter point being one of the greatest railroad centers in the State and also one of the most progressive cities) and from Pylton to Ashland, Ala.

The Great South Georgia Section, the center of which is pierced by the rails of the ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD, has made such wonderful strides in agriculture and general development in the last few years that attention has been attracted thereto from all parts of the Union. As the building of the ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD progressed, towns and cities sprang into existence, and are now among the most prosperous and progressive in the State.

An investigation of the United States Census for 1910 will show that the increases in population of the towns along the ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD have been phenomenal. As examples: Douglas, the county-seat of Coffee County, 43 miles west of Waycross and 98 miles west of Brunswick, increased in population between 1900 and 1910, 475 per cent., or from 617 people in 1900 to 3500 people in 1910. Waycross, the county-seat of Ware county, increased in population 144 per cent. Fitzgerald, Ga., founded in 1895 and splendidly located, increased in population 218.93 per cent. On the Thomasville Line are located the splendid towns of Thomasville, Moultrie, Tifton, and other towns intermediate are rapidly advancing in development. Magnificent farms have been opened up by people moving in from all sections of the country who are prospering, thereby giving a testimonial of the wonderful resources of the Great South Georgia Country.



MAP OF ATLANTA, BIRMINGHAM & ATLANTIC RAILROAD, AND CONNECTIONS.

The prosperity of the people who have located in this wonderful section of our country is working as a magnet in attracting a continuous flow of good, progressive farmers and citizens from all parts of the country to this territory of unexcelled opportunities.

Westward, the line pushes its way through Cordele, the county-seat of Crisp County; Vienna, the county-seat of Dooly County; Montezuma, one of the older and prosperous towns of the State, located in Macon County. Oglethorpe, Talbotton, and then the phenomenal town of MANCHESTER, the junction of the Birmingham-Atlanta Line. This town is six years old, and upon the site it now occupies there was not a single inhabitant six years ago; today Manchester boasts of a population of 2000 people, and is steadily growing.

We next strike Lagrange, the county-seat of Troup County, with a population of about 10,000 people, located in a splendid agricultural and manufacturing district. Here are located seven large cotton mills and a number of other industries. Seven miles west of Lagrange the Line enters the State of Alabama, and passes on to Roanoke, a splendid city of some 5000 inhabitants. Fourteen miles to the west is Wadley, Ala. Upon the completion of the rails of the ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD to Wadley, the site of the present town, there was not a single inhabitant; today, Wadley boasts of a population of over 1000 people, with good, substantial business houses, and is steadily growing.

Twenty-five miles west of Wadley the Line reaches Lineville, one of Alabama's older, but progressive, towns. We next reach Talladega, with a population of about 7000. This is one of the oldest cities in the State of Alabama, and is the home of the State Institution for Deaf, Dumb and Blind. There are also a number of other excellent colleges located there. Talladega ranks as one of Alabama's live and progressive towns.

Moving westerly, we pass through a number of smaller, but flourishing, towns, which were born with the completion of the ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD, entering Bessemer, 12 miles southeast of Birmingham, passing on thence to the city of Birmingham, the "Pittsburgh of the South" in coal and iron production.

From this brief description it will be observed that the ATLANTA, BIRMINGHAM AND ATLANTIC RAILROAD possesses excellent advantages because of its geographical location with reference to the Port of Brunswick and the gateways of Atlanta and Birmingham, and the passing of its rails through the "GARDEN SPOT OF THE SOUTH." This Road is keeping pace with the marvelous development and progress now taking place in the Great Southland. Literature descriptive of the territory, giving facts and figures, will be cheerfully furnished upon application to the General Passenger Agent.

"Double Daily Passenger Train Service" is operated over the entire line of the Atlanta, Birmingham and Atlantic Railroad, with sleeping car service between Atlanta and Thomasville.

Trains are electric lighted and otherwise elegantly appointed, affording passenger service of the highest standard of excellence. Unsurpassed through and local freight train schedules.

J. L. EDWARDS  
Traffic Manager

C. B. KEALHOFFER  
General Freight Agent  
ATLANTA, GA.

W. H. LEAHY  
General Passenger Agent



# Louisville & Nashville Railroad

## Manufacturers

### Seeking Locations

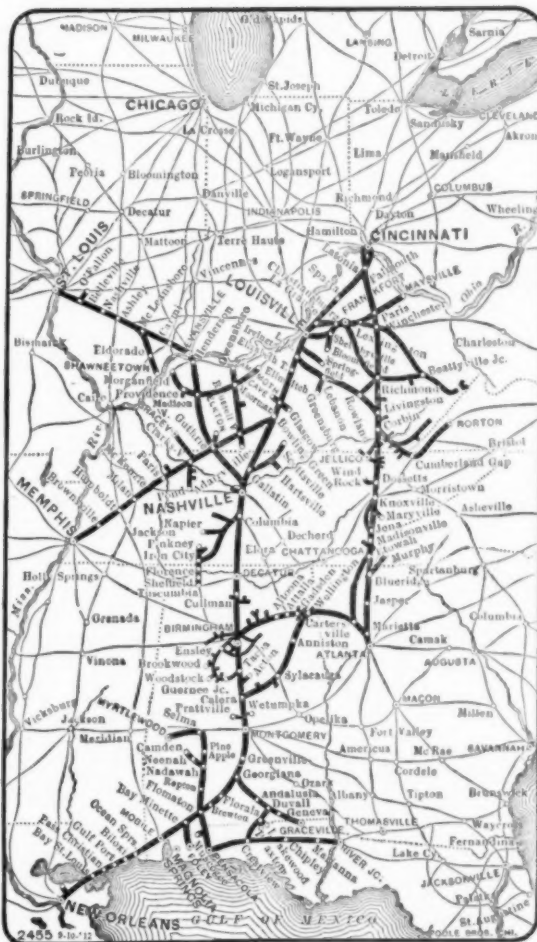
for all kinds of  
Woodworking Plants  
Textile Mills  
Potteries  
Brick and Tile Factories  
Marble, Granite and Stone  
Quarries  
Talc, Kaolin and Iron Deposits

## Farmers

### Seeking Fertile Lands

will find them unexcelled for  
General Farming  
Stock Raising  
Peaches and other Fruits  
Vegetables and  
Berries, in the  
Sunny South

Will find  
Good Openings  
Quick  
Transportation  
Raw Material  
in abundance  
on the  
Great Trunk  
Line



The seasons are long  
growing ones

The cattle need little  
feeding

The climate is healthy,  
the winters are mild,  
there is an abundance  
of good water.

And the terms for secur-  
ing land are easy and  
the price is moderate.

For information about Freight Matters  
address

D. M. GOODWYN  
General Freight Agent  
Louisville, Ky.

For information about Lands and Industrial Matters, address

G. A. PARK  
General Immigration and Industrial Agent  
C. B. COMPTON  
Freight Traffic Manager  
W. A. RUSSELL  
Passenger Traffic Manager  
LOUISVILLE, KY.

For information about Passenger Matters  
address

R. D. PUSEY  
General Passenger Agent  
Louisville, Ky.





# Through "The Heart of America"

## Linking the South, the "Land of Opportunity,"

Many noted experts have told of the marvelous resources in soil, climate and minerals of the mountain region known as "The Land of the Sky," through the very heart of which the Clinchfield runs. Of it Judge Kelley of Pennsylvania, at that time known as "The Father of the House of Representatives," said:

"It is the most glorious country upon which my feet or eyes ever rested.

As to the mountainous region of the South, it is richer in natural wealth and in advantages for the development of that wealth; it has a finer climate, better water and higher conditions of health than any region of which I have any knowledge, and is withal one of the most beautiful regions of the world."

General Thos. L. Rosser, for some years chief engineer of the Northern Pacific Railroad, wrote of the immediate section of Southwest Virginia through which the Clinchfield line has been built:

"It is a region without a peer in wealth of timber, coal and iron ore."

Prof. N. S. Shaler of Harvard University, in *Scribner's Magazine* for October, 1890, said of this section:

"We find a climate resembling in its range of temperatures those which characterize the most favored regions of the world, and it is there, perhaps, we may look for the preservation of our race's best characteristics."

Edward Atkinson, the noted political economist of Boston, in 1890 wrote:

"When this great section of heavily timbered mountain ranges and broad high valleys, sometimes called 'The Land of the Sky,' which had been kept from view by the surrounding pall of slavery, first began to be opened, the writer ventured to describe it, with the Cumberland and Piedmont plateaus on either flank, and the high upland of Georgia and Alabama on the South, as comprising 'an area nearly as large as France and twice the area of Great Britain,' containing a potential in agriculture equal to either, and mineral and timber equal to both combined."

Of the Ohio Valley, which through this line will pour its wealth of travel and traffic to the

South, and of the Piedmont South, two regions forever linked by this road, Professor Shaler said:

"Within a century the area occupied by these States is likely to contain a larger population than that which now exists in all English-speaking countries. Although this population is destined to be to a great extent engaged in mining and manufacturing, there is room in this country for an agricultural people exceeding in numbers the present population of the United States."

From the vast coal fields of Southwest Virginia (and now being extended to Eastern Kentucky), across watersheds, down rich valleys, over tablelands, through the mountains of "The Land of the Sky," and through forest regions of undeveloped wealth runs the Clinchfield to the center of the cotton mill interests of the Piedmont region of the Carolinas.

This territory is practically a virgin land, rich in minerals, timbers, water-powers, agricultural opportunities and in commercial and industrial possibilities of every description awaiting large development.

Since the beginning of time the vast latent wealth of this wonderful country has lain dormant, due to its inaccessibility. With the building of the Clinchfield a remarkable transformation has taken place; manufacturing plants have been established to utilize varied mineral deposits; great timber areas have been opened up; more attention is being devoted to farming, fruit growing, cattle raising, etc.; new towns are being developed, and on every hand can be seen an industrial activity that is indicative of greater things in the future. The Clinchfield with its connections affords

# Runs the Clinchfield Railway

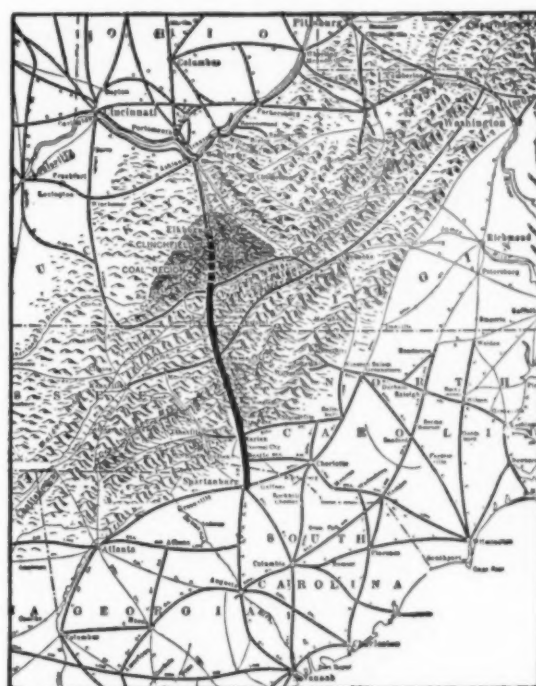
## and the Already Developed West

transportation facilities which enable the products of its territory to be distributed to the country's best markets. Both the Norfolk & Western and the Southern Railways are crossed, giving outlet to the north and east on the one hand, and the south and southwest on the other. At its southern end connections are made with the Seaboard Air Line, the Atlantic Coast Line and the Southern Railway, enabling shippers to reach the whole South and leading seaports for coastwise and foreign trade. Its Elkhorn extension, now under construction, will carry it into Eastern Kentucky, where it will have connections with the Chesapeake & Ohio and other roads affording western outlets.

Occupying a strategic position in relation to the country's great consuming areas, with an abundance of raw materials to manufacture a wide range of products, with soil and climate suitable for raising farm products of all kinds, with climatic and scenic advantages not surpassed or equaled elsewhere in America, if in the world, the Clinchfield territory presents inviting opportunities to investors, manufacturers, home-seekers and farmers.

The Clinchfield early recognized the great wealth-creating value of the resources of its territory, and in order that authoritative information might be presented to investors, man-

ufacturers, farmers, home-seekers and others, it employed men of thorough knowledge to investigate and prepare complete reports covering these resources. It has also established demonstration farms and orchards to prove the adaptability of the soil and climate of its



territory for all classes of farming and fruit growing. This work has provided a fund of information dealing with every phase of opportunity available in its territory.

Detailed facts and active co-operation will be given to those seeking information regarding this territory.

## Carolina, Clinchfield & Ohio Railway

### "The Road of Opportunity"

R. F. BREWER, Industrial Agent

JOHNSON CITY, TENN.



# Carolina and North-Western Railway

## Co.

### Trans-Piedmont Route

From the cotton fields to the peaks of balsam and pine, with the ideal climate peculiar to the Piedmont section of the Carolinas, we can winter the Northwest and summer the Southeast. Altitude ranges from 600 to 6000 feet.

We live the year around in comfort, and have over 125 miles of auto pike roads in an altitude of over 2000 feet.

#### We Want—

To locate a short log mill to use cut-over forest stuff in mission furniture.

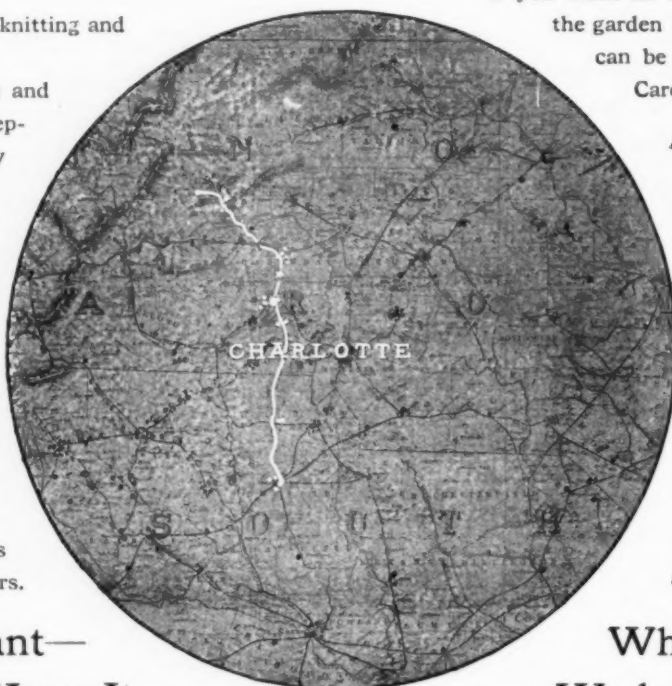
Want a dyeing and print goods, knitting and all classes of cotton mills.

Want wagon factories, furniture and woodworking plants; an exceptionally fine location for a toy factory to use waste from woodworking plants.

Want wood alcohol, pulp and acid plant.

Want some one to develop stone quarries.

The Carolina and North-Western Railway runs through developed and undeveloped territory. The natural resources of which offer the finest opportunities for the above and many others.



#### What Do You Want—

#### We Have It

#### We Have—

The climate, the soil, the market, and the transportation.

If you want an orchard, farm, or desire to go into the garden truck business, no better location can be found than along the line of the Carolina and North-Western Railway.

Apples, cabbages, Irish and sweet potatoes, celery, tomatoes, wheat, rye, oats, are grown easily and with profit.

Poultry and cattle raising are industries offering great possibilities which are worthy your investigation.

The undeveloped lands can be bought from \$4.00 to \$10.00 an acre, or fully improved up to \$200.00 per acre.

#### What Do You Want—

#### We have It

The CAROLINA AND NORTH-WESTERN RAILWAY is in the midst of the greatest Hydro Electric Power development in the South, the Southern Power Company paralleling its line from Chester, S. C., to Hickory, N. C.

Also a number of smaller undeveloped water powers, from 100 to 1000 H. P., that may be purchased and developed so cheaply as to make very profitable and desirable sites for hosiery mills, overall factories, and plants of like character. Excellent opportunities and finest locations for dyeing, bleaching and mercerizing plant, and the Carolina and North-Western Railway offers the best possible freight rate to all distributing centers, as well as over 60 cotton mills from which to draw trade.

Our forests supply woodworking and furniture plants. With room for more, this section is successfully competing with the world.

We can help you locate. In your inquiry state what you want and it will have prompt attention, giving full clear-cut information.

## Carolina and North-Western Railway Co.

General Offices, CHESTER, S. C.

## Place Your Plant Where the Need for it is Greatest

Your business will make most where it is needed most. If you are about to start some new business, or to establish a branch of an old, whether factory or retail store, you would be interested in the unfilled wants—

### Along the St. Louis, Southwestern Railway Lines (COTTON BELT ROUTE)

Now there are especially good openings for woodworking plants of all kinds. On 60 miles of our line, in East Texas, with scarcely more than one-third of the land in cultivation on either side, there was paid to farmers in 1910 \$1,200,000 on peaches and tomatoes alone, an average of \$20,000 per mile on only two products. From figures at hand this amount was exceeded in 1912. This is a greater showing than can be made by any other line of railroad for a similar distance. It required over 3600 cars to handle the fruit and vegetable movement off of our line last season, and it WAS NECESSARY TO ORDER CRATING MATERIAL AND BASKETS FROM POINTS AS FAR NORTH AS WISCONSIN AND MINNESOTA; yet right in this vicinity is an unlimited quantity of material suitable for this class of manufacturing—in fact, for all kinds of woodworking—elm, hickory, oak, ash, cottonwood, gum, etc.

There are also good openings for clay plants, with raw materials close by, all kinds of clays for fire and building brick, tile, pottery, etc. Cottonseed-oil mills, roller mills, shoe-last factories, farm implement

factories, canneries, creameries, are greatly needed at many points. Ample supplies of cheap fuel, lignite, etc.

The Cotton Belt Route's Industrial Department has the most minute facts on the needs in every city and section, facts which enable it to connect the right business with the right location.

The shipping facilities offered by the Cotton Belt Route should alone be a big inducement for your business. The Cotton Belt Route maintains the most regular fast freight service of any road running to the Southwest between St. Louis, East St. Louis, Cairo, Memphis, etc., and points in Missouri, Arkansas, Louisiana, Texas, New Mexico, Arizona and California, and provides through package cars to the principal points in the Southwest. Its complete switching facilities, punctual movement of cars from and to platforms and its recognized willingness to co-operate toward the success of a business along its line should be a big incentive to any intending manufacturer.

Let us give you details about the openings for your special line. We will be pleased to make a special investigation of any point in which you may become interested without cost or obligation.



On the 1st and 3d Tuesdays of each month there are very low round trip excursions to Arkansas and East Texas via Cotton Belt Route. Take advantage of these excursions to look into the big opportunities in these rich territories. You will come back fully convinced that no other sections offer such great chances to the wide-awake farmer or business man. For full particulars write or call on

W. J. DOYLE,

Industrial and Immigration Commissioner

ST. LOUIS, SOUTHWESTERN RAILWAY LINES

1328 PIERCE BUILDING, ST. LOUIS, MO.

## "QUEEN OF SEA ROUTES"

### Merchants and Miners Transportation Co.

STEAMSHIP LINES

Between—

BALTIMORE—SAVANNAH—JACKSONVILLE

BALTIMORE—BOSTON—PROVIDENCE

(Via Newport News and Norfolk)

PHILADELPHIA—SAVANNAH—JACKSONVILLE

PHILADELPHIA—BOSTON

PHILADELPHIA—PROVIDENCE—FALL RIVER

(Freight Only)

Through tickets on sale to principal points, including meals and stateroom accommodations. Fine Steamers. Best Service. Low Fares. Rooms De Luxe. Baths. Wireless Telegraph on all Steamers. Send for Booklet.

"Finest Coastwise Trips in the World"

W. P. TURNER, P. T. M., Baltimore, Md.



# THE KANSAS CITY SOUTHERN RAILWAY

Passing Through a Greater Diversity of Climate, Soil and  
Resource for Its Length Than Any Other  
Railway in the World

*On its line are over four hundred miles from which merchantable timber is drawn, two great coal fields, with an aggregate output of 12,000,000 tons, the greatest lead and zinc mining district in the world, with a product valued at \$18,043,379 in 1912, another field in process of development; two great oil and gas fields; the greatest sulphur mines in the world; immense beds of slate and deposits of marble; raw material for cement, brick, tile and pottery, and a vast area of fertile land, producing grain, livestock, cotton, sugar, commercial truck and fruit crops.*



NEW UNION PASSENGER STATION, FT. SMITH, ARK.

Greater Kansas City, population 484,978, the northern terminus; and Port Arthur, Tex., the finest deep-water harbor on the Gulf Coast, the southern terminus, and lying between them the splendid cities of Pittsburg, Kans.; Joplin, Mo.; Fort Smith, Ark.; Texarkana, Ark.-Tex.; Shreveport and Lake Charles, La.; Beaumont, Tex., and a hundred or more towns with 500 to 5000 inhabitants.

## Splendid Opportunities for Business

If you are seeking a location for the purpose of opening a farm, planting an orchard, raising commercial truck, raising live-stock or poultry; or for the purpose of establishing fruit evaporators, preserving, pickling or vinegar works; or to build or operate tanneries, flour mills, grist mills, cotton gins, cotton mills, woolen mills, cottonseed-oil mills, fertilizer works, or to manufacture pine and hardwood lumber wagons, agricultural implements, furniture, cooperage, fruit packages, boxes, paper stock, woodenware of every description; to operate a creamery or cheese factory; or to quarry building stone, or slate; or to manufacture brick, tile, sewer pipe or clay products of any description; or to mine lead, zinc, iron; or to engage in a mercantile business of any kind; or operate foundries, machine shops or iron works; or, if you desire to travel for health, for pleasure or for sport, for all of which there are splendid opportunities on the line of the Kansas City Southern Railway, write to

**WM. NICHOLSON, Immigration Agent**

Thayer Building

**KANSAS CITY, MO.**

# A New Leader in Southwestern Development



Solid as a Rock, \$13,891,993 Bank Deposits

Population 28,015  
1910 Census

**LOCATION:** See the map below. Near the junction of four States whose population increased 25 per cent. between 1900-1910. Shreveport's rate 75 per cent.

**TRANSPORTATION:** Eleven lines of eight railroads, supplemented by all-year navigation of Red River.

**FREIGHT RATES:** Unusually favorable adjustments enable Shreveport to reach an empire of trade territory, national in its scope, cheaper than any other Southwestern city. Low "water rates" to Gulf ports make Shreveport pre-eminent among interior Southwestern cities.

**FUEL AND RAW MATERIALS:** The largest producing gas field in the Union (according to U. S. Geological Survey), lignite beds, sulphur and salt mines, a big oil field, marble and bauxite deposits. The largest cut of yellow pine, cypress, gum, oak,

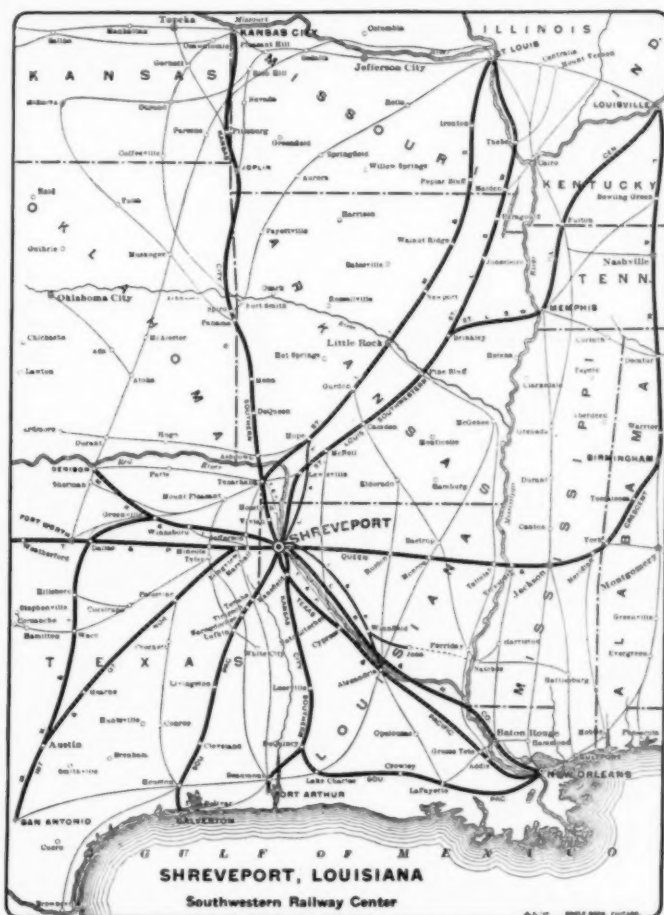
hickory, cottonwood and tupelo comes from the Shreveport district.

Second in the State in population; first in progress.

The amount spent for new buildings; the number of new industries established; the wonderful strides made in civic development put Shreveport in an enviable position among all Southern cities.

**CLIMATE:** Nestling among the rolling, pine-clad hills, 276 feet above sea level, SHREVEPORT has a climate beyond compare. Mild summers without a sunstroke tempered by cool nights. Only eight days in thirty years with temperature as low as ten above.

The Shreveport district has 252 crop-growing days every year and a soil whose possibilities for alfalfa, corn, cotton and other staples are unlimited. Alluvial river lands and sandy upland soils.



## SHREVEPORT STATISTICS

### POPULATION

1900—16,013 1910—28,015 1912\*—33,085

\*Cumberland Telephone Co. census.

Building permits, 1911	-	-	-	\$1,259,062
Building permits, 1912	-	-	-	1,522,633
Assessed valuations, 1901	-	-	-	\$5,505,423
Assessed valuations, 1911	-	-	-	15,005,000
Post Office receipts, 1902	-	-	-	\$64,430
Post Office receipts, 1912	-	-	-	129,788

Increased capital and output of factories between 1899 and 1909.

Capital, 202.6 per cent.

Output, 134.1 per cent.

Paved streets, 47 miles; paved roads, 25 miles, 100 additional miles building.

1911 Oil production, Caddo field, 6,995,828 Bbls.

Elaborate literature and authoritative detailed information furnished in confidence without cost or obligation by

**E. L. McCOLGIN, Secretary**

Shreveport Chamber of Commerce

SHREVEPORT, - LOUISIANA



# CAROLINA COAST COUNTRY

More than a Million Acres Open to Settlement

Rich Black Loam Corn Lands  
Virgin Soil Two to Ten Feet in Depth

Only Twelve Hours from New York

Nearness to the Great Northern Cities, cheap Transportation, a mild Climate and low-priced Lands make this the best Farm and Colonization spot in America. Twenty million people are within reach of a produce freight rate of only 25 cents per barrel from Norfolk, Va. Lands available in any desired area, from the 20-acre plot to tracts of 50,000 acres and upwards.

Trucking - General Farming - Corn and Hay - Livestock - Cotton

The Great Gulf Stream Land Midway Between North and South  
Without Extremes of Heat or Cold

The recently completed Norfolk Southern Railroad system through Eastern North Carolina has opened up this section of the State to advantageous settlement. Here the farmer, the trucker and the livestock man will find rich acres awaiting him; acres that for fertility, healthfulness and nearness to market stand unequalled in America.

Descriptive booklet, "Corn, Cotton and Cash," colored maps and folders of fancy facts sent for the asking.

W. W. CROXTON, General Passenger Agent

B. E. RICE, Land and Industrial Agent

E. D. KYLE, Traffic Manager

## Norfolk Southern Railroad

NORFOLK, VIRGINIA

# FARM LAND DEVELOPMENT

EASTERN NORTH CAROLINA

Ten Thousand Acres - Black Loam Lands

In Preparation for Settlement

Over Twenty-five Miles of large Drainage Canals and over fifteen feet elevation above sea level insures perfect drainage for the entire tract. A complete system of good public roads under construction, will serve the property.

Entire development located directly on the Norfolk Southern Railroad and surrounds the new town-site location of Wenona.

### North Carolina State Experimental Farm

Already located and in operation on the property and adjoining Wenona town-site.

A railroad demonstration property, "Wenona Farm," also adjoins the town and opposite from the State Experiment Farm. Wenona Farm made a corn yield of 174 bushels per acre for the season of 1912, and grown at a cost of only 12 cents per bushel.

State department soil analysis for the Wenona district shows nitrogen 0.66%, phosphoric acid 0.11%, potash 0.34%. Soil from three to five feet in depth, 55% humus, a typical deposit formation.

Farming lands in the Wenona district are now offered for sale at reasonable prices and easy payment plan. Colonization tracts of similar lands, located nearby, undeveloped areas and offered in any acreage quantity desired.

Inquiries and correspondence solicited. Address

## Jno. L. Roper Lumber Co.

Land Sales Department

NORFOLK, VIRGINIA

# FINEST CLIMATE ON EARTH!

YOU WANT HENDERSONVILLE, N. C. WANTS YOU

Elevated 2252 Ft. on a 100 Sq. Mile Plateau, Surrounded by a Mountain Amphitheatre of Indescribable Grandeur

Exceptional Opportunities For

## Manufacturers--Investors--Home Seekers

Most Powerful Single Water Power Development East of the Rockies Under Way

EXCELLENT LABOR CONDITIONS

LOW FREIGHT RATES

LOW COST  
OF LIVING

LOW ASSESSMENT OF TAXATION

DESIRABLE FACTORY SITES

Abundance of Hardwood Timber, Mineral and Agricultural Resources

Paved and Well Lighted Streets

Excellent Sewerage System

Pure Mountain Spring Water

GOOD

ROADS

No Mists. No Fogs

No Malaria. No Mosquitoes

No Weather Extremes

New Public School Building Pronounced Best Equipped In the State

HENDERSON COUNTY EXCELS IN

TRUCK AND GENERAL FARMING - APPLE GROWING - DAIRYING AND POULTRY RAISING

### INDUCEMENTS FOR DESIRABLE INDUSTRIES

— WE INVITE INVESTIGATION —

Address H. C. Meyer, Secretary, Greater Hendersonville Club, Hendersonville, N. C.

*The Most Progressive and Public Spirited Community in the Appalachian Mountains*

## Cold Facts About the State of South Carolina

(Summary of Statistics From the U. S. Census)

#### Value of all Farm Property:

1900 .....	\$153,591,159
1910 .....	392,128,314
Increase .....	\$238,537,155 or 155 per cent.

#### Value of Farm Land—

1900 .....	\$99,905,860
1910 .....	268,774,854
Increase .....	\$168,868,994 or 169 per cent.

#### Average Value of All Property per Farm—

1900 .....	\$989
1910 .....	2,223
Increase .....	\$1,234 or 124.8 per cent.

#### Average Value of Land per Acre—

1900 .....	\$7.14 (U. S. \$9.03)
1910 .....	19.89 (U. S. 28.60)
Increase .....	\$12.75, or 178.6 per cent.
Value of crops in 1910 .....	\$140,009,000

An increase of 28.4 per cent. in one year, the greatest increase shown in any State in the Union.

Increase of 1910 over 1900 .....	\$31,000,000
Increase of 1910 over 1906 .....	63,000,000
Increase of 1910 over 1900 .....	88,685,000

South Carolina now ranks 13th among the States in value of agricultural products, having risen from the 21st position in one year's time.

#### A STUDY IN CORN

	Production.	Value.	Yield Per Acre.
Crop of 1900 .....	17,429,610 bu.	\$9,149,808	7.0
Crop of 1904 .....	22,189,837 bu.	15,532,886	12.4
Crop of 1907 .....	23,611,233 bu.	17,236,200	15.1
Crop of 1910 .....	31,580,000 bu.	25,896,000	18.5

If, when you have studied the above information and statistics, you desire carefully prepared literature and careful consideration of any requests for data, address a communication to

**E. J. WATSON, Commissioner**

State Department of Agriculture, Commerce and Industries

COLUMBIA, S. C.

South Carolina offers the home-seeker good soil at moderate prices and a wealth of natural resources seldom found in such great variety

	Production.	Value.	Yield Per Acre.
Crop of 1911 .....	32,578,000 bu.	\$29,646,000	18.2
Crop of 1912 .....	34,278,000 bu.	.....	.....

#### A FEW COMPARISONS

South Carolina, in value of crops per acre of cultivated area (1910),

leads them all with .....	\$23.01	Indiana .....	\$10.40
Connecticut .....	22.50	Nebraska .....	5.65
Illinois .....	10.37	Kansas .....	5.64

South Carolina's Crop Value per square mile of cultivated area

(1910) is .....

Illinois .....

South Carolina's Value of Crops per square mile of actual territory is (1910) .....

Illinois .....

Indiana .....

#### ALL MANUFACTURING

	Capital.	Value of Product.
1900 .....	\$62,750,000	\$53,336,000
1904 .....	113,422,000	79,376,000
1910 .....	173,221,000	113,236,000
1911 .....	.....	118,284,336

#### TEXTILE MANUFACTURING

	Capital.	Value of Product.	Spindles.
1912 .....	\$83,952,266	\$73,376,669	4,463,911
1911 .....	78,889,154	70,927,990	4,322,264
1910 .....	73,070,000	69,473,038	4,088,782
1904 .....	82,337,429	49,437,644	2,864,092
1900 .....	39,258,946	29,723,919	1,431,349
1890 .....	11,141,833	9,800,798	332,784



We are too modest to brag; too wise to be egotistic; too busy to be envious, but we can state facts and this is one of them that

## Spartanburg, South Carolina, Is A Hummer.

WHY THIS PROMINENCE? The answer is, its splendid railway systems, its great volume of commerce, its business and educational institutions, and its unequaled citizenship, worthy in every sense of the name they bear, "SPARTANS."

It is a town which does things in cyclone style. It is the center of education of South Carolina. It is the center of cotton manufacturing of the South.

Education and enterprises make things hum, and we are humming. Payrolls, smoke stacks and college towers are builders of great cities, and we have them.

In this gateway of upper South Carolina is located a bank called the FIRST NATIONAL, with a capital of \$500,000 and a surplus of \$100,000.

It has reversed the order of nature and grown stronger with age. The weak grow strong and the strong grow great in SPARTANBURG. This bank makes friends of its patrons and always endeavors to further their interest. Will you join us in this friendly march of progress? We have always taken interest in the people as well as from them.

The man who saves is the man who prospers.

## First National Bank SPARTANBURG, S. C.

## Ocean Steamship Lines

FROM BALTIMORE

Hamburg American Line to  
Hamburg

Red Star Line to Antwerp

Lord Line to Belfast, Dublin and  
Cardiff

Atlantic Transport Line to London

RATES QUOTED ON APPLICATION TO

Atlantic Transport Co.  
AGENTS

201 to 207 Chamber of Commerce Building  
BALTIMORE

## The Alfalfa Route

A word or two about the Alabama, Tennessee and  
Northern Railroad, Tombigbee Valley and  
Mobile Terminal and Railway Company.

One hundred and eight Saw Mills in operation—Twenty-five to fifty years of available timber cutting in sight—Thousands of acres of Alfalfa Hay raised and marketed at big profit—Prize Corn and Cotton Crops—Diversified farming and trucking satisfactorily handled.

The above-styled lines, better known as the "Cochrane System," is the biggest little railroad in this part of the traffic world, now having 195 miles in operation. In its surveys in a northerly direction from its present terminus, Reform, Ala., it was hardly realized that it would be its good fortune to tap such a magnificently productive territory as has been found since the survey was begun in Fayette county, that it would tap the only undeveloped coal fields left in Alabama (which are unexcelled as to quantity and quality south of the Ohio), and that it would serve the already discovered oil and gas fields of that county. In samples of white sands taken at random recently by engineers from unlimited fields is shown the possibilities of either handling this raw product or the operation of glass works that should bring from the present center of such industries the greatest of manufacturing plants of the North. Deposits of iron ore have been brought in that in texture show as fine specimens as have been discovered in any counties of Alabama; a kaolin of such quality for making pottery that will rival the best beds of France. Magnificent crops are being made in this territory, and there are numerous other natural resources along this line of road to make tonnage, making it a certainty that this company will be taxed to its utmost to take care of the natural products of the territory it serves, regardless of the through business from other connections that it will enjoy. The contemplated extension of this line in a northerly direction will bring it in connection with trunk lines which will be able to use it as a through line to the port of Mobile, lines now having practically no such exclusive opening, and it would be quite impossible to estimate the large increase in tonnage of entirely new business that these companies will thus control with MOBILE as the

**MOST DIRECT ROUTE TO THE PANAMA CANAL**  
and the Latin Countries

For information write to

JOHN T. COCHRANE, Prest., or to RUSSELL HOUSTON, G. F. & P. A.  
Mobile, Ala. Mobile, Ala.

## DAILY BULLETIN

ISSUED BY THE

MANUFACTURERS RECORD

FOR the benefit of business concerns, engineers, contractors, machinery manufacturers, dealers and others who find it profitable to follow up daily the industrial, commercial, railroad and financial development of the South and Southwest as published in its Construction Department,

The Manufacturers Record issues every Business Day  
in the Year

THE DAILY BULLETIN

The construction news as published in the Daily Bulletin is invaluable to all business people who want to keep in daily touch with the organization of business enterprises of all kinds throughout the whole South. Unlimited possibilities for the creation of business, for securing contract work, for the sale of machinery and supplies of all kinds, for bond buyers and others, are to be found through a close following up of the news in the Daily Bulletin.

The Daily Bulletin is an exceptionally desirable advertising medium.

The subscription price is \$25.00 a year. Are you a subscriber to it, or an advertiser in it? If not, you are missing an opportunity for profitable business.

For further information write  
MANUFACTURERS RECORD, BALTIMORE, MD.

**POLES AND POSTS**

Telegraph, Trolley and Telephone Poles, mountain grown, the strongest and most lasting. Also Yellow Locust Posts, the best of all. Write

**THE ALBEMARLE ORCHARD CO.**  
CHARLOTTESVILLE, VA.

**Florida Asks a Question**

Why not come to the one section of the country having all the essentials for successfully raising fruits and vegetables—the West Coast of Florida in Hillsboro County and Lake Butler region, where sun, soil and climate cannot be surpassed? Good markets at hand. Good roads, schools, churches and other conveniences. The Tampa & Tarpon Springs Land Co. want to develop this part of the State so that it will be creditable to them and profitable to purchasers, and offer, on very favorable terms, proven citrus and truck land, and their proposition affords a splendid opportunity to the industrious man of moderate means. Illustrated booklet and details gladly sent on request.

**Tampa & Tarpon Springs Land Co.**  
TAMPA, FLA.

**TEXAS LANDS**

For Sale—2500 acres unimproved irrigable high-grade farm land, solid body, all tillable; lies smooth and level; ideal farm irrigation; soil rich chocolate loam, 3 to 4 feet deep, free from rocks or grubs, all ready for the plow; choicest corn, cotton, wheat, oats, alfalfa, fruit and truck land. Inexhaustible supply pure water for irrigation purposes at easy access. A genuine investment. Price \$15.50 per acre. Colonization tracts, 10,000 to 50,000 acres, solid bodies, agricultural land, \$12.50 per acre. Ranch lands, \$6.50 per acre. All crops except tropical plants are successfully grown here. Best climate in Texas. Mild winters; cool summers. Greatest stock farming and feeding country in the world. For further information, descriptive literature, address:

OTUS REEVES REALTY CO.

Plainview, Hale County, Texas

**Orient Co. Ltd.—Northwest Louisiana Co. Ltd.**

No. 826 Perdido Street, 2d Floor, NEW ORLEANS, LA.

Louisiana Timber, Mineral, Farm and Cut-Over Lands  
New Orleans Unimproved Residence Property and Factory Sites

Yesterday the rush of Railways, Settlers and Investors was to the West; today it is to Canada, but tomorrow the Panama Rush will sweep it to New Orleans and Louisiana. Beat the Rush; don't follow it.

**TEXAS LANDS**

Our land department is prepared to offer some excellent bargains in Texas lands. Correspondence solicited. Following are some tracts which we offer:

17,000 acres in Starr and Zapata Counties, \$5 per acre.

6,000 acres in Zapata County, frontage on Rio Grande River.

25,000 acres in Duval County, fine for colonization, new railway practically sure, price \$12 per acre.

Our loan department is prepared to place money for you to net 7 and 8%; guaranteed title; sworn appraisements. If you have money to loan write us.

Address Desk M. R.

**Alamo Home Builders**

505, 507, 509 Navarro St.  
SAN ANTONIO, TEXAS

125,000 acres south-east Georgia cut-over lands. \$3.00 per acre.

60,000 acres East Tennessee timber and coal lands, will cut 4000 feet hardwood timber per acre. Two veins of coal 47.50 per acre.

75,000 acres West Kentucky lands, borders 14 miles along the river. Four veins coal. \$20.00 per acre for coal rights.

**S. T. RANDLE**

Real Estate and Investments

PADUCAH, KY.

**FOR MILL STONES FOR GRINDING CORN**

Address John T. Wyatt, Salisbury, N. C., R. D. 3, Box 10, Rowan Co., proprietor Wyatt's Mountain Granite Works. Portable Corn Mills, Street and Cemetery Curbing, Street Car Flange Track Blocks, Paving Blocks, Cross Walks, Monuments, etc., furnished. We won a medal and diploma at the St. Louis Exposition for the good quality of our millstones. Size from 10 to 18 inches in diameter. We ship to portable corn mill builders in car lots as well as retail. We superintend the opening of new granite quarries for capitalists on salary or royalty.

**Wants to Act as Agent**

WANTED—To act as Agent for individuals, companies or syndicates to buy agricultural lands in this section. Have number good propositions worth investigation. Bank reference furnished. For further information, descriptive literature, address Otus Reeves, Plainview, Hale Co., Texas.



The Main Waiting Room of the

**Pennsylvania Station**

Seventh Avenue and Thirty-second Street

NEW YORK CITY

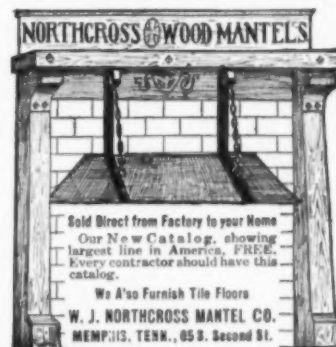
Located in the heart of New York's hotel section, and convenient to its residence district, it is one of the largest and most imposing railroad stations in the world.

It is the Manhattan station for all the through trains between

**NEW YORK and the SOUTH**

via the

**PENNSYLVANIA RAILROAD**





## Here Are Two Men You Need

The "Artist" to create and execute clever, snappy advertising illustrations and designs for your catalog, folder, booklet and trade journal advertisement, etc.

The "Engraver," who faithfully makes the same into good, deep, clear Printing Plates in one or a number of colors.

We also have another department which we call the "Idea Department." It is the duty of this Department to suggest or to collaborate with you as to copy, paper stock, color, etc. This Department is in charge of an Advertising Expert, whose advice should help you.

Drop a line to the "Idea Man," tell him what you would like to do in the way of advertising, and he will soon have "These Two Men" busy in your behalf.

**BALTO.-MD. ENGRAVING CO.**

28 S. Charles Street  
Baltimore, Md.



## Established Thirty-one Years Ago The MANUFACTURERS RECORD

has, since its first issue, been devoted wholly to the upbuilding of the South; taking as its motto,  
"The Development of the South Means the Enrichment of the Nation."

As there is no other section just like the South, in this or any other land, so there is no other publication just like the Manufacturers Record in this or any other country.

When anyone thinks of the South, of its great resources, its rapid development and its splendid future, he naturally thinks of the Manufacturers Record.

When anyone thinks of the Manufacturers Record, he inevitably thinks of the South. The two are inseparably connected in the public mind.

The Manufacturers Record is closely studied by all classes of people; railroad officials, manufacturers, bankers, mining operators, engineers, architects, contractors of every kind, educators, students, land operators, general investors, and in fact by intelligent men of every calling, North, South, East and West, and abroad, if they want to know anything about the South, its resources and its progress.



NEW HOME OF MANUFACTURERS RECORD.

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who made possible the publication of

## "THE SOUTH: THE NATION'S GREATEST ASSET"

Here are classified and indexed the products and activities of nearly 500 business concerns, towns, cities and railroads who will give information about the South to those seeking to know of this section. Here will also be found many Eastern and Western houses doing business in the South.

The advertisements represented in this list are filled with interesting information—study them—and in writing the advertisers mention the Manufacturers Record.

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Never before, we believe, in any publication issued in this, or any other country, has there appeared in the advertising pages such a vast amount of information specifically emphasizing, by individual activities, the wide range of any section's development.

In the advertising pages of "The South: The Nation's Greatest Asset" there will be found a variety of information as interesting and as valuable to the student of Southern conditions as the array of facts and figures presented by editorial writers and experts of the highest standing, who, in the editorial and news columns, have combined to present such a picture of the South, its resources, its progress and its potentialities as was never before painted.

Broad generalizations about the South and its potentialities here find overwhelming proof in stories of great interest dealing with specific activities.



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In these advertising pages you will find a catalogue of things that bear directly upon the South and the possibilities which it presents for business. These pages should be studied with care. They contain a wealth of information vitally important to every one in any way interested in the advancement of the South, or who seeks information about this section.

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# CONSOLIDATION COAL

## Vast in Quantity---High in Quality

The Consolidation Coal Company owns over 300,000 acres of coal lands in the States of West Virginia, Kentucky, Pennsylvania and Maryland.

These properties embrace the finest coal lands in the world.

It is conservatively estimated that its coal properties contain 2,150,000,000 tons of coal available for mining.

At present 84 bituminous coal mines are being operated, with others being added from year to year.

The output of the Company is now 14,000,000 tons annually, and is being steadily increased.

At this present rate of mining the company's properties contain sufficient coal to last for over 200 years.

The reason for the enormous growth of the business of this Company, and the continuous and growing demand for its coal is simply that "Consolidation Coal," "The Coal of Carbon," fits the need of the consumer.

Carbon makes heat and carbon lies in "Consolidation Coal."

A constant and continuous supply can always be relied upon whether you want George's Creek Big Vein Cumberland Coal, Somerset Smokeless Coal, Fairmont Gas Steam Coal, Miller's Creek Block Coal or Elkhorn By Product Illuminating Gas Coal.

Our expert chemists and engineers have tested each kind of coal, and we will be glad to study your power problem without charge and prescribe the kind of coal to fit your needs. In other words, we can solve your coal problem and aid you to operate your plant on the most economical basis.

This Company has complete facilities for distributing its coal over the United States, and for coastwise and foreign shipment.

The vast operations of this Company, extending over four States, are under the direct control and management of men with life-long experience in the coal mining industry, and a thorough-going, practical knowledge of modern methods of the distribution and sale of coal to meet modern needs.

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C. VON H. KALKMANN, Asst. Gen. Mgr. Sales

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Boston, R. C. Gillespie, Manager,  
50 Congress Street.

Baltimore, H. C. Thomas, Manager,  
Continental Bldg.

E. M. MANCOURT, Western Mgr.,  
Fisher Bldg., Chicago, Ill.

Cincinnati, Traction Bldg.,  
T. H. Richardson, Mgr.

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14 Wall Street.

Washington, W. A. Leetch, Manager,  
Union Trust Bldg.

Louisville, Ky., Paul Jones Bldg.,  
G. E. Davis, Mgr.

General Offices, Continental Bldg., Baltimore, Md.

North Western Fuel Co., Pioneer Press Bldg., St. Paul, Minn.

LONDON, G. W. Rutherford, European Mgr., Billiter Sq. Bldg.

GENOA, E. Bianchini, Mgr., 14 Via Luccoli.



JAMES G. TINSLEY, Vice-President  
E. L. BEMISS, Vice-President

JOHN SKELTON WILLIAMS  
President

S. D. SCUDDER, Vice-President and Treasurer  
R. J. WILLINGHAM, Jr., Secy. and Asst. Treas.

## CAPITAL ONE MILLION DOLLARS

# RICHMOND TRUST & SAVINGS COMPANY

1109 East Main Street

RICHMOND, VIRGINIA

### BANKING DEPARTMENT

The Company receives the deposit accounts of individuals, firms, institutions, corporations and banks, and allows upon them interest as liberal as is consistent with sound and prudent banking.

Deposits may be sent by mail. *Special attention given to the accounts of country and other out-of-town depositors.*

As Fiscal or Financial Agent for States, Cities, Railroad and Industrial Corporations the Company is prepared to attend to the management of Sinking Funds and the payment of Coupons and Dividends, and to assist in the negotiation of new issues of sound securities for conservative and well-managed corporations.

The Company will also entertain propositions for the financing or reorganization of meritorious enterprises of inherent worth and value.

A PERSONAL CALL AT OUR RICHMOND OFFICE  
WILL BE APPRECIATED.

### SAFE

5½% TO 6½%  
INVESTMENTS

### AND

5% to 6% First Mortgages (principal and interest guaranteed by the MORTGAGE GUARANTEE CORPORATION) on Improved Virginia Real Estate

A fully equipped  
REAL ESTATE DEPARTMENT  
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FOREIGN & TRAVEL DEPARTMENT (Information Bureau)  
S. H. Bowman, Manager.

### TRUST DEPARTMENT

This Company is authorized by law to receive and execute trusts of every character, of courts, corporations and individuals. Acts as Executor, Administrator, Guardian, Assignee, Receiver and Trustee, and as the Custodian of Wills, either sole or in conjunction with individuals.

*It takes charge of property, real and personal; collects and remits interest, dividends, rents and income promptly, and is prepared to discharge faithfully all duties of trust known to the law.*

Trust investments are kept separate and apart from the assets of the Company.

The Company acts as Trustee of mortgages and as Transfer Agent and Registrar of the Stock of corporations.

This Company will also act as Virginia Agent for reputable outside interests desiring to operate under the Virginia Corporation Laws, with a "home office" in Richmond.

CORRESPONDENCE FROM THOSE WHO CANNOT  
CALL IS CORDIALLY INVITED

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Virginia-Carolina Chemical Co.

CHARLES J. ANDERSON  
Geo. W. Anderson & Sons,  
Merchants.

JOS. B. BEASLEY,  
President Union Bank of Richmond

E. L. BEMISS,  
of John L. Williams & Sons  
Bankers.

JAMES D. CRUMP,  
President B. F. Johnson Publishing Co.

JOHN S. ELLETT,  
Vice-President National State and  
City Bank.

GEO. A. GIBSON,  
of Gibson & Moore, Insurance.  
EPPA HUNTON, Jr.,  
Munford, Hunton, Williams & Anderson,  
Attorneys at Law.  
GEO. BEN JOHNSTON, M. D.,  
Physician and Surgeon.

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Secretary and Treasurer Richmond  
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JOHN T. WILSON,  
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JOHN L. WILLIAMS

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ESTABLISHED 1874

# JOHN L. WILLIAMS & SONS BANKERS

Corner 8th and Main Streets

RICHMOND, VIRGINIA

MEMBERS RICHMOND AND BALTIMORE STOCK EXCHANGES

## CITIES, COUNTIES AND OTHER MUNICIPAL CORPORATIONS

having new issues of Bonds to dispose of are invited to correspond with us. Entire issues purchased

## CAPITAL FURNISHED TO

RAILROAD AND INDUSTRIAL CORPORATIONS OF PROVED WORTH AND STANDING FOR  
PURPOSES OF ENLARGEMENT AND FURTHER DEVELOPMENT ON FAVORABLE TERMS

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DESIRING TO PLACE THEIR FUNDS IN SOUND SECURITIES OF ESTABLISHED VALUE,  
YIELDING FROM

4½% to 6½%

ON THE INVESTMENT, ARE ESPECIALLY INVITED TO SEND FOR OUR LISTS OF HIGH CLASS  
BOND OFFERINGS.

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